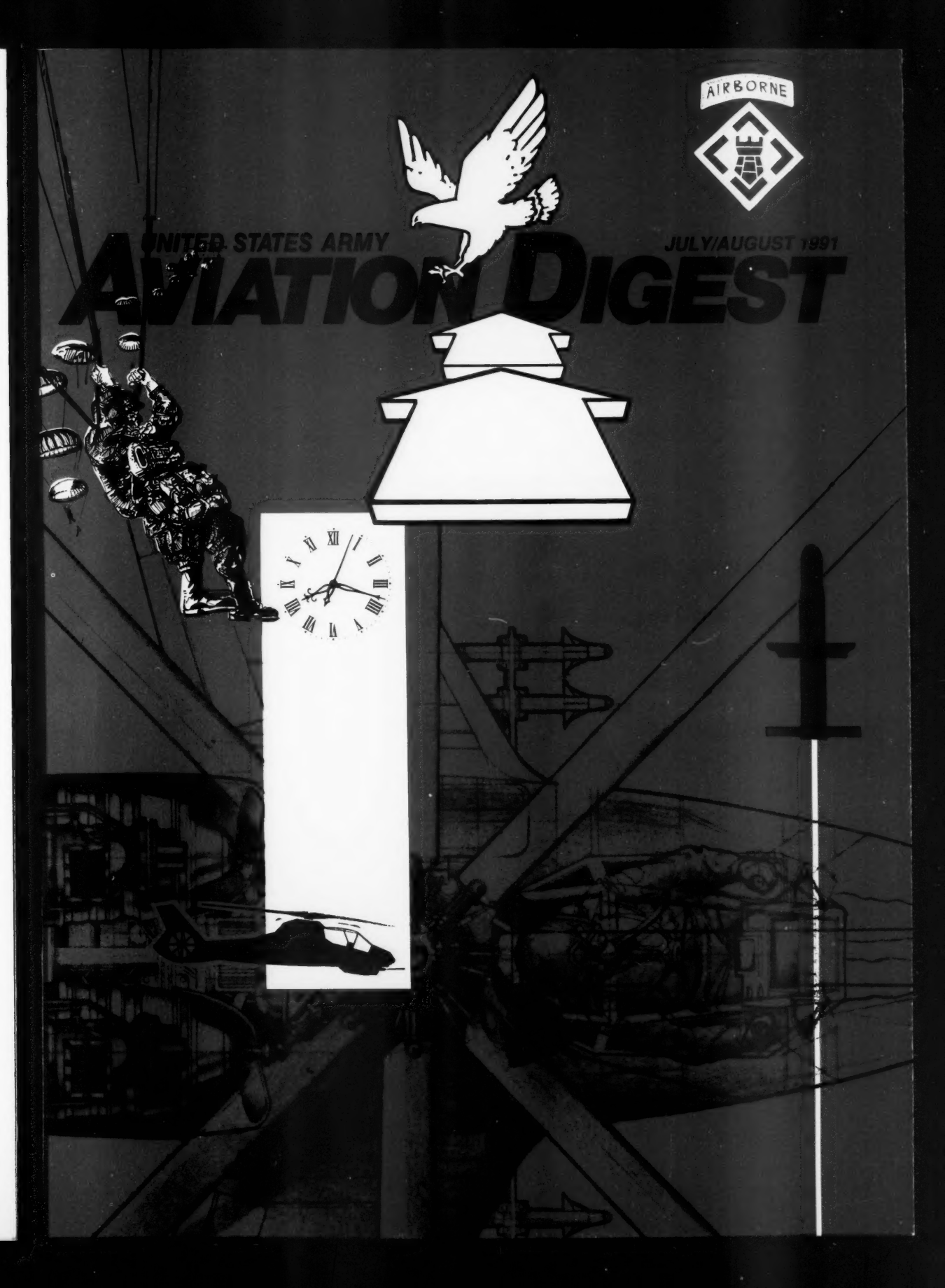

UNITED STATES ARMY

AVIATION DIGEST

JULY/AUGUST 1991

AVIATION DIGEST

PROFESSIONAL BULLETIN

1–91–4 ▪ JULY/AUGUST 1991

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About the Cover: In the lead article, "Design for Tempo, Part 2: Aviation as a Maneuver Arm," page 2, the authors tell how the Aviation Air Arm can move to attack quicker, over longer distances, and more frequently than the ground-based force. This large mobility differential proves the fact that the aviation-based maneuver force holds a decisive advantage over the ground-based force.

Major General Dave Robinson
Commander, U.S. Army Aviation Center

Patricia S. Kitchell, Editor
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Major General Rudolph Ostovich III

On my departure from Fort Rucker as Chief of the Aviation Branch, I should like to thank General Foss and the soldiers of the Training and Doctrine Command on whose shoulders rests the responsibility as architect of the future while training the Army for war. He and his command have done a magnificent job, judging from the decisive victories the Army has achieved during his watch. The tough issues we addressed together had the single purpose of making sure our Army remains the best army in the world. Thanks, General Foss, for that opportunity to serve.

Thanks to all the soldiers and civilians throughout this great land who are committed to the defense of this nation.

To our friends from the Wiregrass who have given our Fort Rucker soldiers and their families the best military community environment in the whole United States.

To our friends from industry for your contributions to victory through excellence in development and production. Without your contributions our Army would not be the kind of modern, capable force it is today.

To the soldiers of Fort Rucker. Your dedicated, selfless service has made us all proud to be Americans.

To the many heroes of the past who have left us a legacy we now strive to deserve.

In departing, a few pictures of the past months come to mind.... Germans on both sides of the Berlin Wall, beating it down with sledge hammers. As quickly as it went up some 45 years ago, it came tumbling down, and with it came a unified nation, a restructuring of the European landscape, and victory in a cold war.

Secretary Cheney and General Powell addressing the nation in the early morning hours of a cold December day. "Our military forces," they said, "have assaulted into Panama to take down a criminal and restore democracy to a freedom-loving people." This would be the first of two times Americans would go to war since the

continued on page 23

Major General Dave Robinson

During the past 2 years, dramatic and irrevocable changes have occurred in the strategic environment. These changes have already affected national military strategy and the forces needed for its execution. As we collect the lessons from recent conflicts and plot a course for the remainder of the century, we shall build on the warfighting vision Major General Rudolph Ostovich brought to Fort Rucker, AL. He inherited a new combat branch and saw it battle tested in Operations Just Cause and Desert Storm. The aviation soldiers and leaders trained at Fort Rucker and matured in our line organizations proved worthy.

The Ostovichs leave a legacy of care and concern that has made a lasting mark on our branch and made Fort Rucker a great place to live and work. As they move on to important duties in Washington, DC, I ask that you join me in wishing them every success and happiness in the future.

The Cold War is a past legacy. The Warsaw Pact is defunct and the Soviet threat, previously monolithic and relatively easy to delineate, has adopted a defensive doctrine yet continues to modernize its forces. There are dangerous trends in the Third World fostering unprecedented regional instabilities—clearly, we live in uncertain times. Consequently, the Army must be prepared for a variety of contingencies that are not easily predicted. It is imperative that we build a flexible army—an army with a credible projection capability and the combat power to deter or defeat aggression.

These strategic uncertainties are coupled with domestic pressures for reduced spending. These new conditions present challenges and opportunities captured in the following imperatives:

First, we must produce a credible force with fewer troops. While high-technology modernization is essential, there will be significant investment constraints. Clearly, every unit, every leader, every soldier, and piece of equipment must count.

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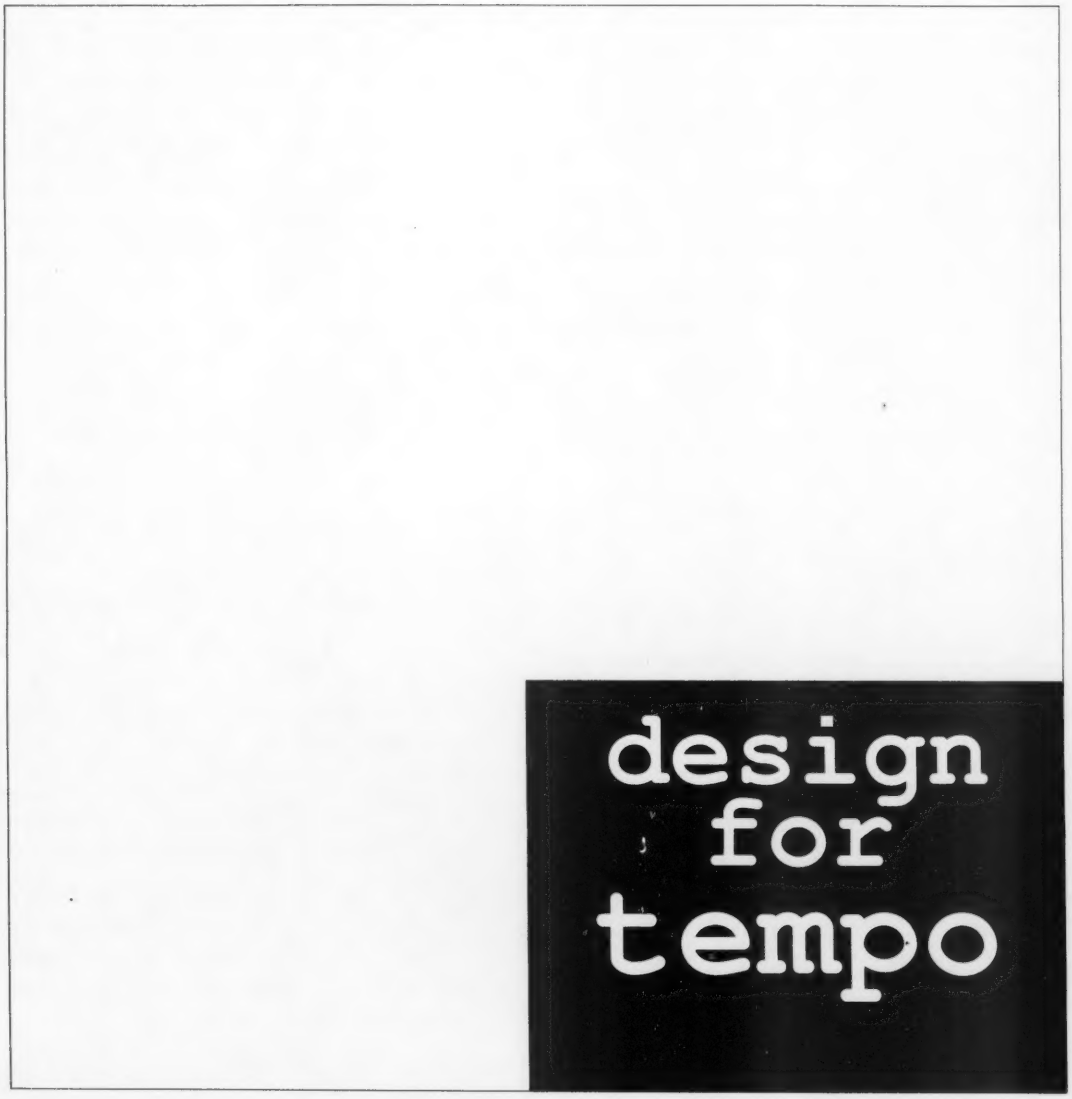
Colonel Patrick J. Bodelson
Chief of Staff
U.S. Army Aviation Center
Fort Rucker, AL

Captain Kevin B. Smith
Aviation Planning Group



PART 2: Aviation as a Maneuver Arm

This article is the second in a series on force design and the war-fighting capability of a force. It asserts the clear advantage of the Aviation-based maneuver force over ground-based concepts in structuring the Army's future combat-efficient force.

Field Manual (FM) 100-5 defines maneuver as the "movement of forces in relation to the enemy to secure or retain positional advantage. It is the dynamic element of combat—the means of concentrating forces at the critical point to achieve the surprise, psychological shock, physical momentum, and moral dominance which enables smaller forces to defeat larger ones."[1]

Other armies have similar definitions. The Soviets, for example, describe maneuver as "...an organized movement of troops (forces) during combat operations to a new axis (line) and region for the purpose of taking an advantageous position relative to the enemy in order to deliver a decisive strike."[2] A consensus, of sorts, appears to be established, and it allows an analysis of what constitutes effective maneuver.

Importance of Maneuver

Why is maneuver, as opposed to an attrition style of warfare, or even holding ground, important? "By far the majority of winners in battles in which the beginning force ratios were generally within...reasonable limits...were those who somehow seized the initiative from the enemy, and held it to the battle's end. Most often the initiative was successfully seized and held by maneuver.... The successful application of maneuver theory turns on speed and precision of response, doubly so when one bears in mind the effect of Clausewitzian friction."[3]

"No matter how casualties are measured, battles have been given up for lost when casualties ranged from insignificant to overwhelming...just as for troop casualties, no dominant pattern emerges from a study of equipment losses...the principal condition associated with defeat appears to have been the use of maneuver by an enemy (64 percent of 80 cases studied)."[4]

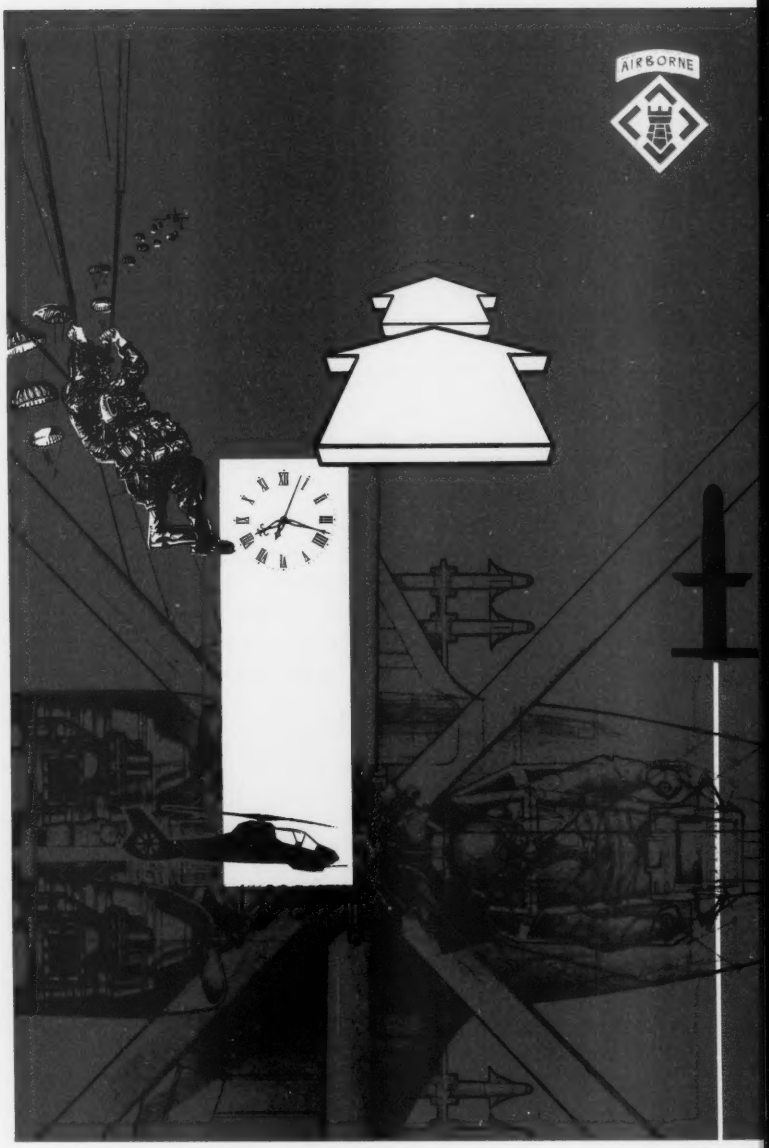
After a mission briefing in a North Atlantic Treaty Organization corps' tactical operations center, a former Wehrmacht officer remarked, "There is no sign here of the idea that was bludgeoned into all of us old General Staff officers: Possessing the terrain doesn't matter; what matters is to shatter the enemy and then the terrain will fall into your hands by itself."[5]

Some consider maneuver a means to an end—the end being the lethal application of fires. Others claim, with substantial historic precedent, effective maneuver can cause the collapse of the enemy without an actual engagement. While this second case is obviously the ideal, the first case is the practical goal. The maneuver force must, therefore, possess the ability to destroy the enemy, once the positional advantage is reached.

The enemy simply will not sit still and allow you complete freedom to execute the designed plan. As you maneuver, so does he—"...war consists of two independent wills confronting each other—where there is but one will there can be no war, only a massacre. Though each of the contending opponents is to some extent bound by the nature of the means at his disposal and the environment in which he operates, neither those means nor that environment is ever so constrictive as to preclude considerable freedom of action."[6] Thus, the requirement is not only to maneuver but to do so at a faster tempo than the enemy can counter. If your enemy possesses a physical speed equal to your own, then the increase in tempo must come from another source such as C^3I (command, control, communications, and intelligence), surprise, and other sources.

Also, the maneuver of forces does not take place on a battlefield of perfect information. Mistakes are inherent in the conduct of war—"With

design for tempo
PART 2



each side free and, presumably, willing, to double-cross the other to the utmost of his ability, the progress of the struggle between them is largely unforeseeable. Consequently, the attainment of certainty is, a priori, impossible."[7]

Grappling with the difficulties of executing a force-oriented counterattack posed special problems for the students attending the School of Advanced Military Studies (SAMS), Fort Leavenworth, KS. "The key variable between the scenarios was timing: so critical was timing to these counterattacks that the group named a 'conclusion' after the student officer who coined it. Campbell's corollary was: 'All counterattacks are either too early or too late.'"[8]

One of the prerequisites to an effective maneuver force, then, is the ability to recover from errors in 'aim.' In effect, this requires a greater tempo, and eventually, a greater physical speed than the enemy.

Measures of Maneuver

The essential measures of maneuver are *time*, *space*, and *mass*. Because any battlefield advantage is always a temporary and fleeting thing, the effective maneuver force must be able to traverse large distances quickly, pass, and deploy to fight, and then recover in the same manner. "...a body of men...should be organized into two groups, the one offensive and the other defensive. The latter may be formed into a protected base for the former to

operate from; that is, a harbor to set out from and return to. Thus is established the primary tactical division between the fighters; they are divided into those who can better deliver blows and those who can better withstand them. The one hits, the other holds; the one moves, the other stands firm."[9]

Armies that have learned to use this mobility differential have generally succeeded. Armies that have forced two tiers to operate at a common, lower speed, however, have usually failed. The premier case in point is the difference between the French and German method for tank employment before the May 1940 battle for France.

The French theory stated tanks were to be used to support foot infantry in close combat. The German theory held to the notion that tanks, along with other motorized elements, were to move fast, shattering the enemy to great depth. The Wehrmacht theory exploited the mobility differential to its maximum capability. The French theory held the tank to the speed of the foot infantry.

None of this is to imply that, by a single maneuver, the whole battle will be won. In fact, a battle may require dozens of 'maneuvers,' and a campaign may require literally hundreds. So, the idea quickly follows that a force must not only gain a positional advantage over the enemy, and do it with a higher tempo, but must recover to maneuver again and again. This implies a sufficient ability to supply, man, and sustain the operational tempo required on the battlefield. Richard Simpkin warns, "For an order of operational mobility you pay an order of endurance."[10]

An Effective Maneuver Force

Thus far, the essential elements of an effective maneuver force are that it must—

- ☐ Possess the means to kill the enemy upon arrival at the 'positional advantage.'
- ☐ Maneuver at a faster tempo (time, space, mass) than the enemy can counter.
- ☐ Retain an ability to recover from errors in 'aim.'
- ☐ Retain sufficient ability to supply, man, and sustain the operational tempo required on the battlefield.

Mechanics of Maneuver

A typical 'maneuver' normally flows through five distinct phases as follows:

March: During the march phase, the combat vehicles of the unit usually are arrayed in a linear formation(s) that facilitate(s) rapid controlled movement on good surfaces. The march must cover the distance to the enemy force as rapidly as possible—without losing control of the force. Using standard terminology, the march phase begins at the start point, proceeds along a designated route (or routes), and passes through a release point.

Deploy: The deploy phase serves to transition the combat force from the march formations into the fighting positions. It is normally characterized by somewhat slower movement than the march phase since each combat vehicle will strive to use the undulations of terrain to mask itself from the enemy. It begins at the release point of the march and ends at, or near, the individual fighting position.

Combat: The combat phase is the application of fires against the enemy. Usually beginning with the appearance of the enemy into a convenient 'killing zone,' it may continue until the unit is ordered to stop

design for tempo
PART 2

shooting, runs out of ammunition, or becomes threatened by some reaction of the enemy. It provides the most severe test of the attributes of lethality and survivability of the combat system.

Retract: At the conclusion of the combat phase, the unit is usually relocated some distance to reorganize and resupply. Nevertheless, on a battlefield with linearity, the unit may relocate only several hundred meters back to a fuel truck that has been brought forward. In the case of a nonlinear battlefield, however, the unit usually executes a longer march to a support area.

Replenish: After retraction, the unit remains stationary for a period of time to allow for refueling, rearming, and for both vehicle and human maintenance.

In general, these five phases apply to any combat system—tank, infantry carrier, helicopter, aircraft, etc. Therefore, they provide a basis of comparison among the different maneuver systems available to the force commander.

Analyzing Phases of Maneuver

March and deploy. Since tanks and helicopters move as units—not as individual systems—the march and deploy phases of maneuver must be understood in terms of how **units** of combat systems move.

"The layman sees the movement of mechanized troops as analogous to the trips he makes in his car, with a bit added on for the size and number of vehicles. For columns of vehicles with a substantial pass time (the time the column takes to pass a point), this kind of thinking gives a completely false picture. As long as running time greatly exceeds pass time—for small bodies of troops moving over long distances; that is, the motorist's approach has some validity. And road movement remains a reasonably efficient process, more or less dependent on the physical mobility of the vehicles concerned." In other words, time to complete (the earliest time the unit or formation is available at its destination) might be described as 'running time plus a bit.'

"But as pass time approaches and then exceeds running time, a totally different picture emerges and the linear imperative really begins to bite. When pass time and running time are equal, the time to complete is twice the running time. Increasing running speed usually leads to disruption of the column by the slower vehicles and a net loss of time. Maintaining normal density, let alone increasing it, is tactically risky within artillery range or in an adverse air situation. All in all, no variation in technique can do more than nibble at the edges of the linear imperative of surface movement."[11]

At the heart of the maneuver issue is the tremendous difference in march, pass, and deploy times between ground vehicles and helicopters. The time required for an aviation brigade—moving 200 kilometers (km) to attack—"...to complete, deploy, and engage would be just under one hour. A tank division with the same run-in on one route would take rather over 10 hours to complete, with running time and pass time just about equal."[12]

Richard Simpkin noted that this order-of-magnitude difference in agility causes the Soviets to regard the aviation brigade "... as an operational formation and rate its combat worth...as equivalent to that of a tank division (with over 10,000 men and about 500 tactical vehicles)."[13] If the future battlefield is envisioned to be nonlinear, with tremendous depth and width, then the retract phase of maneuver becomes equally significant as well—essentially doubling the times quoted in the preceding paragraph. All this indicates that one measure of an effective maneuver

force is the ability to execute the attack mission rapidly, and repeat it frequently over time.

Thus, the aviation-based maneuver force holds a clear advantage over ground-based concepts simply because of the large mobility differential. While some modeling may be required to quantify the exact extent of this mobility differential advantage, the point is essentially settled—helicopters can move to attack quicker, over longer distances, and do it more often.

March and deploy versus errors in aim. The second critical measure of the march and deploy phases of maneuver centers around the ability to recover from errors in aim. As quoted earlier, SAMS coined a rule, Campbell's corollary, indicating that a majority of ground-based counterattacks are either too early or too late. If an attack on a mobile force is too early, it may still have time to react to the initial error in aim. But if a ground combat force is too late, and misses the mark, then the makings of a disastrous 'foot race' with an equally mobile opponent exists.

Using bypassed French mechanized units as an example, Edward Luttwak states, "...the actual mechanics of the rearward race...easily had catastrophic morale effects—not uncommonly leading to the outright disintegration of units."[14] Implied in any foot race of this type is the unmistakable likeness to suffering the effects of a parallel pursuit. An effective maneuver force must, therefore, retain the ability to recover from errors in aim, and still perform the mission.

The main problem, again, is the fact that all ground maneuver takes place at essentially the same speed—

that of the track. The tempo and agility advantages of an aviation-based maneuver system have been discussed previously. They apply to the issue of errors in aim as well. Aviation has the advantage, but the exact extent of the advantage, again, may be better defined through the use of modeling.

Combat phase. The best system for the combat phase of maneuver is the most complex issue because of the multitude of survivability, sensor, and weapons issues that separate tanks from helicopters. Fortunately, enough modeling runs exist at the various JANUS facilities in the U.S. Army Training and Doctrine Command to provide answers to this problem. Obviously, the tank is better protected and possesses more stowed kills. On the other hand, the helicopter usually engages from a greater distance, and retains the speed capability to return quickly to the combat phase with more munitions. One major difference, however, should be taken into account. On a fast-moving, nonlinear battlefield, a ground force should be provided with little or no time to excavate fighting positions. The same principle applies for other supporting 'battlefield functions' as well. In a fast-moving fight, the time required for full synchronization of artillery fire plans, obstacle plans, etc., simply does not exist and should not be provided.

Retract phase. Analysis of the retract phase of maneuver is essentially the mirror-image of the march and deploy phases of maneuver. The same limitations of march speeds and formations apply.

Replenish phase. How much supply effort (ton/miles, people, time) is required for an aviation-based maneuver force; for a ground-based force of the same lethality? These are the prime issues.

Consider the issue of fuel first. An M-1 Abrams tank consumes 56.60 gallons per hour[15] in a cross-country movement at speeds averaging 40 kilommeters per hour[16]—at an efficiency of .7 kilometers per gallon. An AH-64 Apache helicopter consumes 160 gallons per hour[17] in

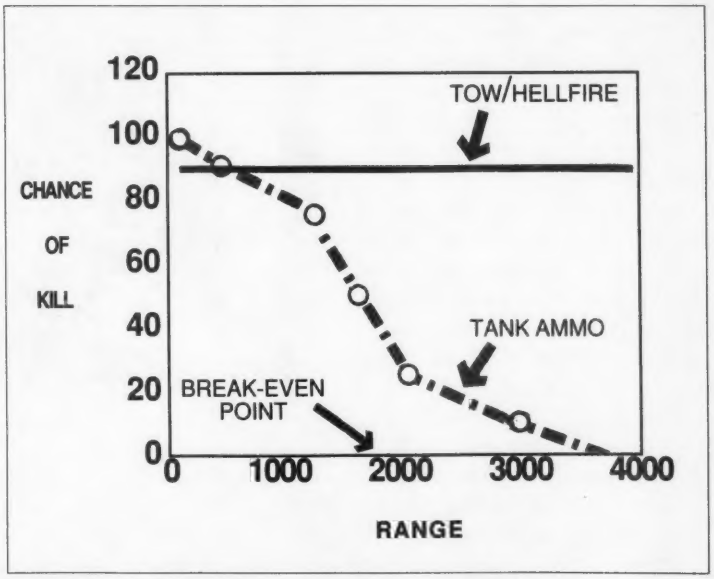
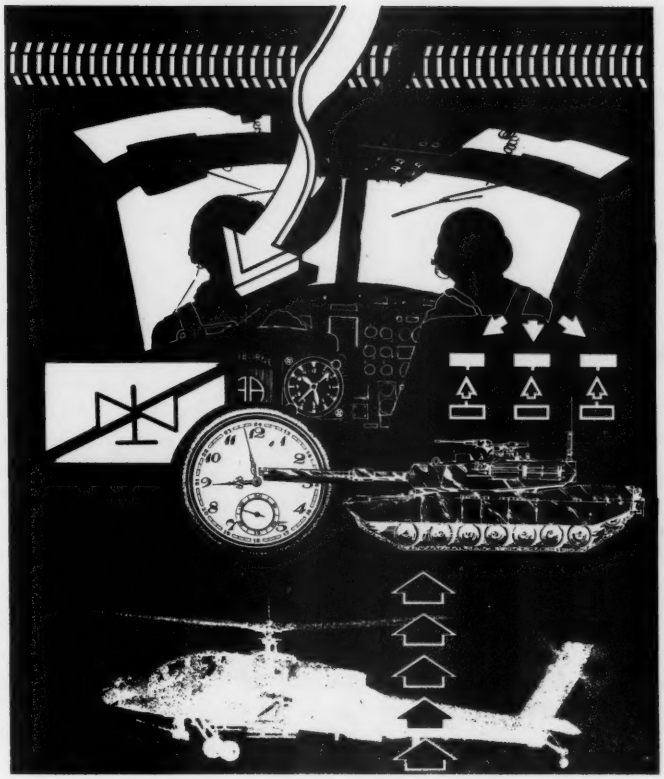


FIGURE 1: Break-even range for comparing weapon load kill probabilities.



a cross-country movement at a cruise speed of 200 km per hour—at an efficiency of 1.25 km per gallon. Although the battlefield speeds of these systems may vary considerably in response to the actual situation, the point of the numerical drill above demonstrates that helicopters are potentially more fuel efficient than tanks in terms of both fuel consumed and also distance traveled.

The second issue is ammunition expenditure versus enemy tanks killed. The chart on page 8 (figure 1) appeared in many Army field manuals of the early 1980s.

If you assume that a tank has a basic load of 40 rounds, and a helicopter carries 16 antitank guided missiles (ATGMs), the relative hit probabilities of each weapon (as shown in the figure) will determine a 'break-even point' of about 1,800 meters (m) where the 16 ATGMs will kill the same number of enemy as the 40 tank rounds. To the logistician, this means that he must transport at least 250 percent more ammunition (in bulk form) if he is supporting a ground-based maneuver force that shoots a majority of its shots at or beyond 1,800m. Again, the battlefield ranges will certainly vary according to the situation, but our doctrine generally is to engage at maximum range.

The third issue is systems reliability—in terms of cubeage and weight of spares, and maintenance man-hours per vehicle-use hour. Generally, tanks are usually simpler and cheaper to maintain in terms of man-hours per use hour. On the other hand, tank spares are, of design, heavier than aircraft spares.

On replenishment, Brigadier Richard Simpkin once remarked, "To a man, the mechanizers of the twenties saw freedom of movement off prepared surfaces as one of the major assets of the 'caterpillar track.' They envisaged the entire mechanized force, logistic backing and all, rolling freely in tactical formation over the countryside like any fleet sailing in blue water. They were wrong, and for three solid reasons.

"Even the best of cross-country vehicles moves far more slowly off roads and other prepared surfaces than it does on them.

"Second, most cross-country vehicles use more deadweight to lift a ton of payload than their road-bound counterparts, and even a vehicle of the same all-up mass uses far more fuel and suffers more wear and tear

across country than it does on roads. The result is that a cross-country supply echelon can easily become self-consuming, requiring a greater weight of fuel and stores than it can carry. Even with roadbound supply vehicles, there are many routes in many parts of the world over which only the lightest of forces can be supplied by land.

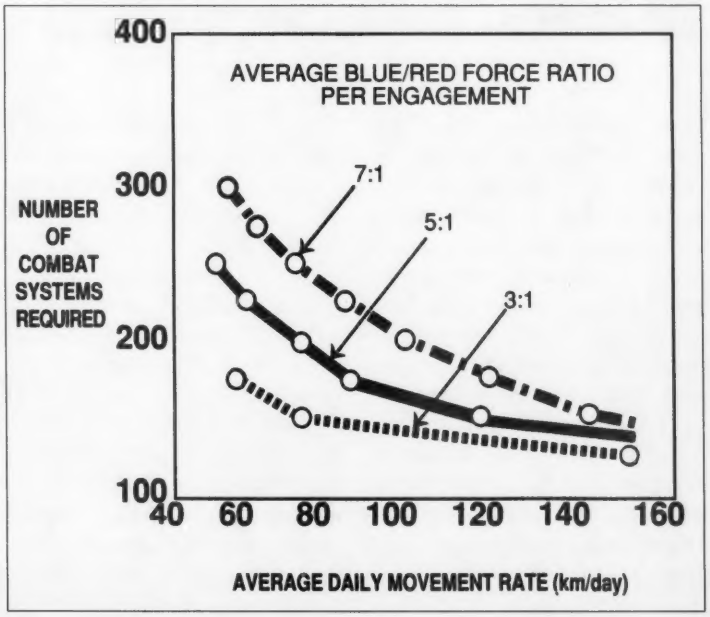
"Third, even if the cost of cross-country logistic vehicles could be tolerated, the money and resources could be put to better military effect."[18]

RAND Corporation's Maneuver Concept Analysis

RAND's principle task in a recent U.S. Army Training and Doctrine Command (TRADOC) Analysis Command (TRAC) study was to "... build and deliver a simple, fast running model that assists analysts in exploring alternative concept designs, and provides a first-order performance estimate to permit immediate screening among them, based upon their 'cost' in resources needed to satisfy specified theater objectives. RAND's modeling effort...used TRAC information on Southwest Asia...but the model is intended to be readily adaptable to other theaters."[19]

Figure 2 displays the effects of changes in the Blue Force average mobility on the overall requirements for numbers of combat systems.[20] The horizontal axis shows the average movement rate (in km per day) of a Blue Close Combat Force. The vertical axis shows the number of combat systems required to meet the success criteria. Each force ratio curve shows the number of combat systems needed by a particular version of the concept as a function of Blue movement rate. For example, if a commander's plan envisioned establishing a 5 to 1 ratio of combat systems at the decisive point, he would require 250 combat systems

FIGURE 2: A parametric comparison of the effectiveness of maneuver speed.



moving at 50 km per day, or about 150 systems moving at 150 km per day.

One conclusion from the RAND data, therefore, is that a smaller number of fast combat systems can achieve the same results as a larger number of slower systems.

Summary

Maneuver is the process of moving a sufficient force to a decisive positional advantage and then destroying or disrupting the enemy before he can take effective steps to counter. The five phases of maneuver as outlined in this article are march, deploy, combat, retract, and replenish.

Within these phases, it can be proven that an aviation-based maneuver force has the advantage in at least three phases—march, deploy, and retract. The advantage in these three phases provides a greater ability to absorb errors in aim as well.

An aviation-based maneuver force may be superior to a ground-based force in the combat phase of maneuver simply because of its superior ability to mass fires quicker over space and time. As the battlefield becomes larger and more nonlinear, this advantage in the combat phase becomes greater.

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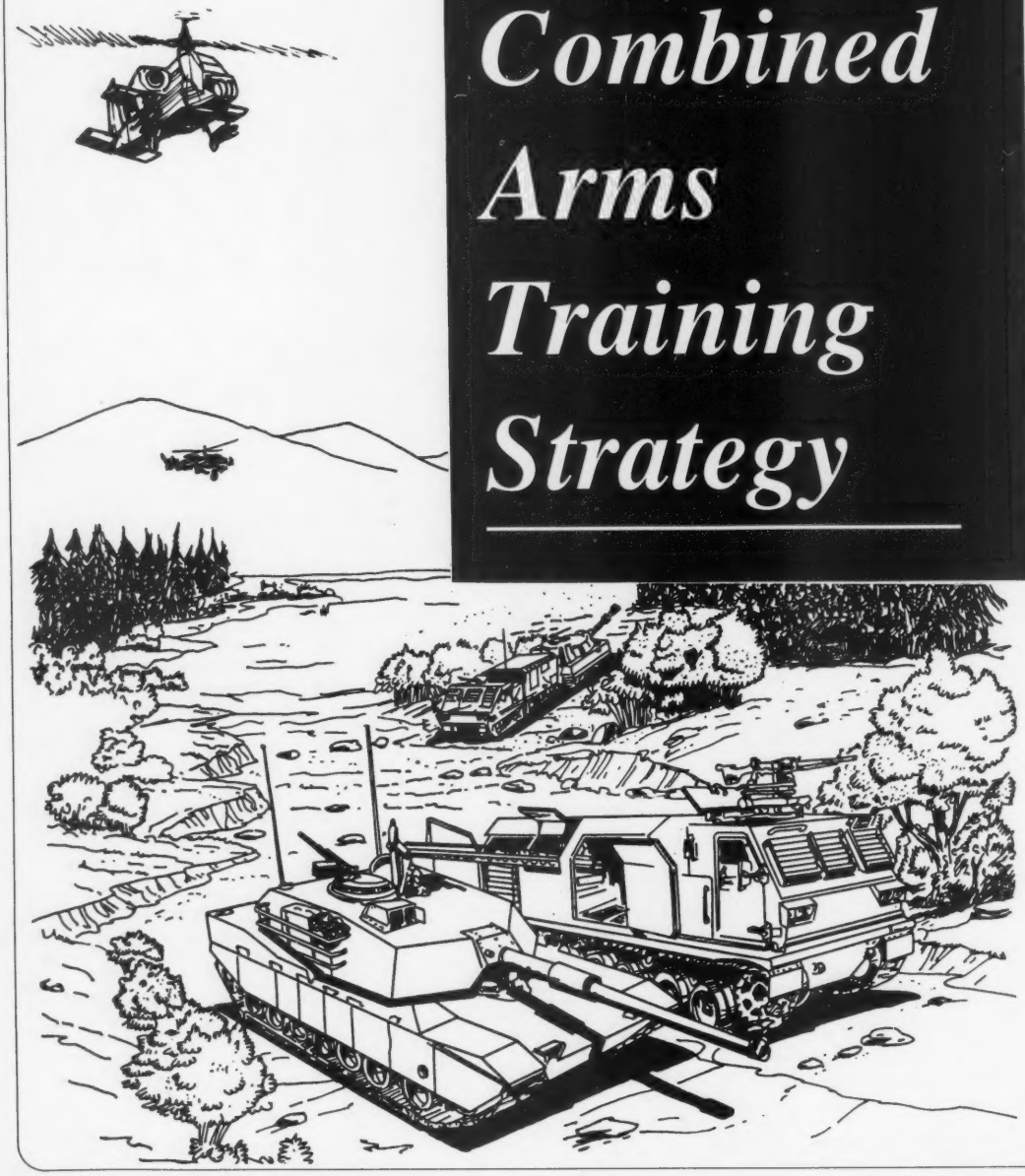
The Combined Arms Training Strategy



Colonel James W. Beauchamp
Director, Directorate of Training and Doctrine
U.S. Army Aviation Center
Fort Rucker, AL

IN THESE TIMES of budget cuts and force reductions, the training needs and strategy of the U.S. Army must be more clearly defined and articulated. To this end, the need exists now for a forward-looking, comprehensive and systematic concept for training management and training resource projection, acquisition, and management. The concept that will meet the need is the Combined Arms Training Strategy (CATS).

The U.S. Army has long recognized the need for a training strategy that outlines the training requirements of the "Total Force" and the integration of required training resources (ammunition, operational tempo, ranges, maneuver areas, and training aids, devices, simulators, and simulations). Under the direction of the U.S. Army Training and Doctrine Command, Fort Monroe, VA, the U.S. Army Aviation Center, Fort Rucker, AL, and other proponents are fully engaged in the development of CATS.

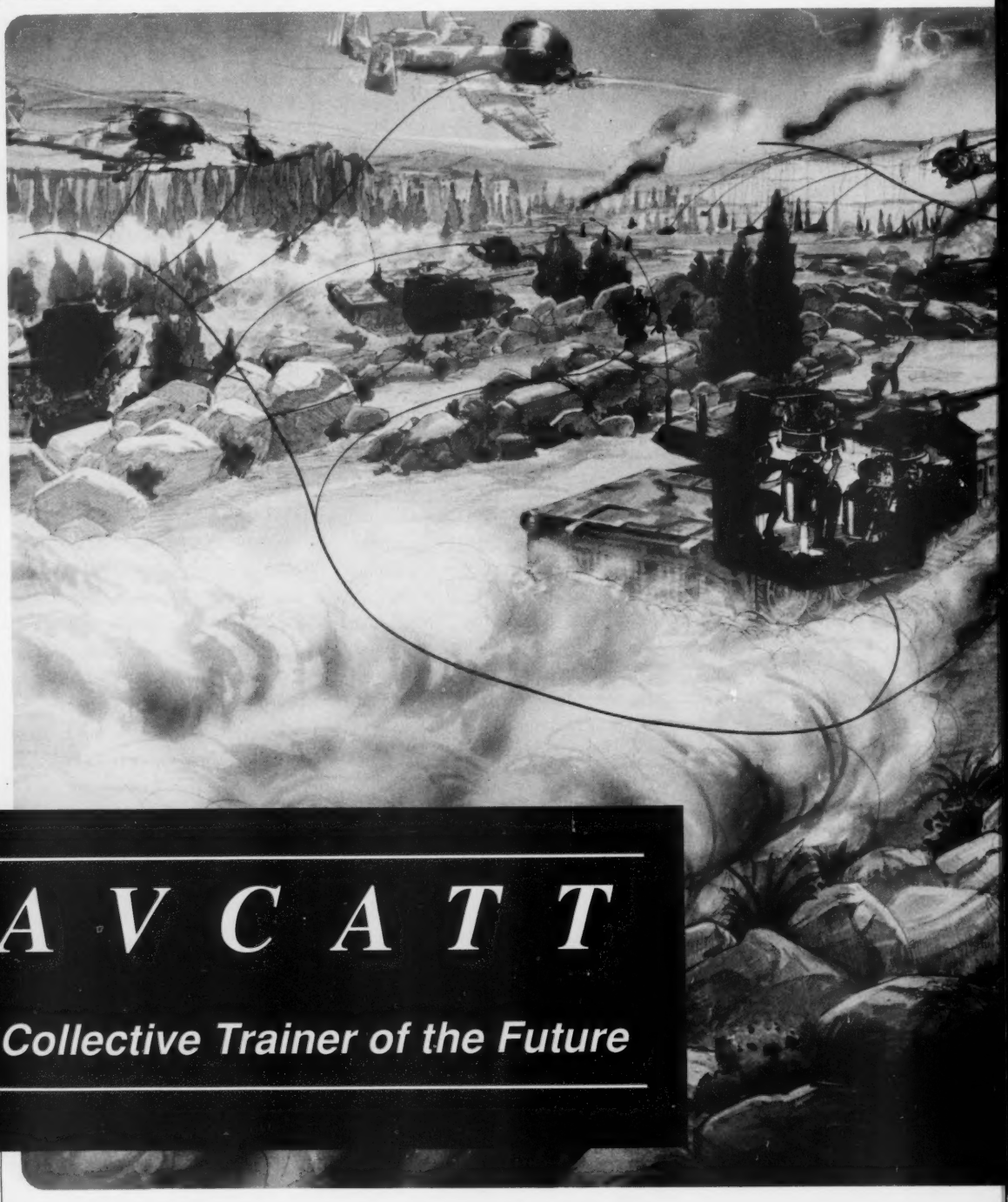
The CATS is based on proponent generated unit and institutional training strategies. The aviation unit strategies consist of three supporting strategies: maneuver training, individual soldier training, and gunnery training. The centerpiece of each supporting strategy is a menu of training events, their frequencies, and resources required to execute them. By delineating training events, their frequencies, and their required resources, CATS will show the relational values of training resources to the required training standard.

The aviation institutional strategies will define exact requirements for training individuals to standards in the schoolhouse. The strategies will illustrate linkage between institutional and unit training. That is, they will show how our training in the institution supports the skills and knowledge needed in the field. Strategies being developed for units are descriptive and those for institutions are prescriptive. Descriptive unit strategies recognize that while there may be a "best" way to train to standards, it is unlikely that all units across the U.S. Army will have adequate resources to execute the strategies precisely as described. The commander must then make value judgements on resource tradeoffs to determine how he will train his unit to standards. Prescriptive institutional strategies will define exact requirements for training individuals to standards.

Although CATS represents new directions in total Army training management and resource management, CATS is not totally new. It is an umbrella concept that embraces principles and concepts outlined in existing doctrinal manuals, training manuals, and resource management plans. CATS is progressive and will be continually refined to reflect changes caused by changing threat, technology, budget, and mission. CATS is developed in coordination with major Army commands, the National Guard, and the U.S. Army Reserve.

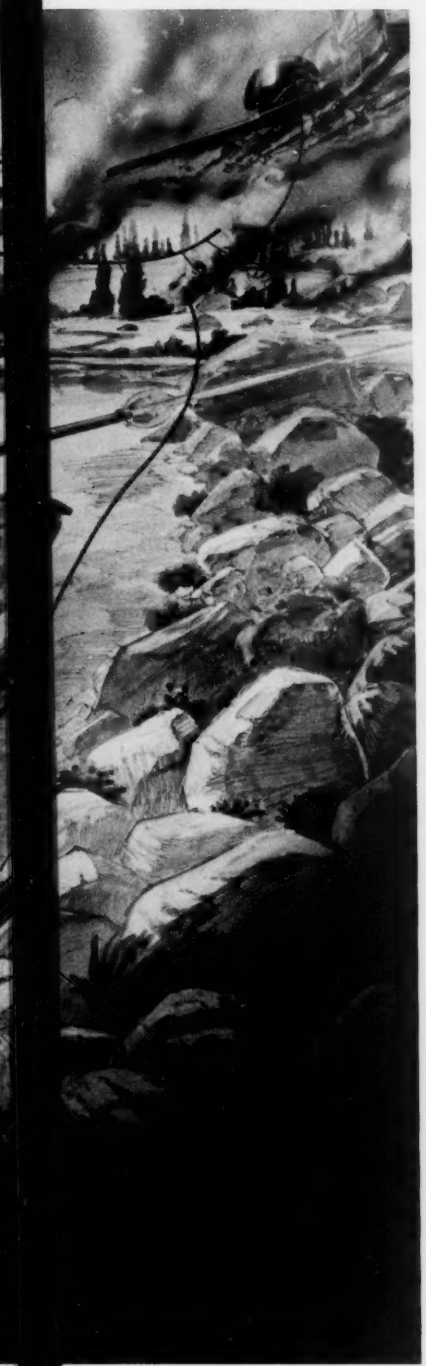
With increased congressional sensitivity to the acquisition of costly training resources, U.S. Army leadership must be able to show where and how training resources support a "Total Force" training focus. We believe CATS, when fully developed and implemented, will give our leadership information needed to make the hard choices on which training resources are most effective and which are affordable.

Because CATS will ultimately play a major role in how the U.S. Army trains, field support and participation in its development are essential. The Combined Arms Command, Fort Leavenworth, KS, recently fielded proponents' draft strategies with selected Active and Reserve Component units for comments. Mr. James D. Patton, Individual and Unit Training Division, Directorate of Training and Doctrine, Fort Rucker, AL 36362-5163, DSN 558-4926/4927, is the point of contact for U.S. Army Aviation. Let us hear from you!



AVCATT

Collective Trainer of the Future



Captain Thomas Stafford
Project Officer
PM TRADE
Orlando, FL

Master Warrant Officer (MW4) Frank Paul
Standardization Officer
Aviation Brigade, 2d Infantry Division, Korea

The face of Army Aviation is rapidly changing.

Complex new aviation systems will be added to the force over the next 10 to 15 years. The Aviation Combined Arms Tactical Trainer (AVCATT) is one of the systems to meet the changes of the future.

Consequently, warfighting doctrine, tactics, and techniques will continue to evolve as time marches on. This is clearly evident if we look back over the recent history of Army Aviation. During the mid-1960s, Army Aviation finally came of age and forever changed the framework of the combined arms battlefield. Attack and utility helicopters saw extensive use in Southeast Asia. They provided maneuver commanders with responsive fire support and unparalleled mobility to anywhere on the battlefield. During Operation Desert Storm, Army Aviation demonstrated unprecedented capability as a vital maneuver force. Now we clearly know modern attack and scout aircraft, coupled with tough realistic training, are enormous combat multipliers.

Our experience in Desert Storm proved modern Army Aviation is beyond a doubt one of the most efficient and effective maneuver arms in history. Its speed, maneuverability, and firepower provide commanders with agility and ability to seize and hold the initiative as never before in history.

When attack and air cavalry operations are synchronized with the operations of other modernized air and ground units, the effect becomes a lethal and an extremely agile combined arms. The bottom line: superbly maintained and employed high-technology equipment is an essential ingredient for success on the modern battlefield.

The mission at hand is complicated by a rapidly down-sizing Army with scant operating tempo funds. That put aside, the task confronting aviation leaders, now and in the future, is twofold: maintaining that edge, honed in the deserts of Southwest Asia; and training the next generation of air combat crews to employ weapons platforms of increasing complexity in an era of dramatically reduced blade time.

Preparedness

As always, the primary mission of all aviators will be ensuring the aviation force is trained and ready. This challenge will be as great or greater than any of us faced in the past.

A quick look into the future shows us none of the combined arms partners will have adequate field training resources to meet readiness objectives. Because of the enormous expense associated with operating aircraft, the aviation element of the combined arms team can expect to face a particularly severe and austere future.

A closer look at present resources reveals an increased difficulty in

planning and executing both proficiency flying and tactical combat flying. Fortunately, work being undertaken today will provide a solution to this dilemma. That solution is based on a greater use of simulation.

Aviation units in the latter part of this decade will have available to them a unique training system based on computer simulation and modeling. Currently, computer-based simulation devices are used to train and sustain individual- and crew-level skills and exercise command and control functions of large units. These simulations and models range in level of detail from high-to-low, based on training objectives associated with the device.

Imagine being able to conduct company-level tactical exercises anywhere on a battlefield 100 by 150 kilometers. Environmental conditions ranging from day-to-night and clear to overcast (including rain, snow, and fog) would be changeable to fit training objectives.

Your company or troop could fight on any one of three types of terrain—European, desert, or jungle. AirLand Battle operations could be conducted.

Actions could be synchronized with those of a ground maneuver battalion or task force. Restrictions on the use of lasers and terrain would not exist. Use of ammunition and fuel would only be limited by the ability of the logistical system for movement and supply. Units would routinely fight against a certified battalion-size opposing force.

All of this could be possible without ever using a helicopter or leaving the installation. The cost of using this logistical system, when compared to the cost of a 5-day field training exercise (FTX) or rotation to the National Training Center, Fort Irwin, CA, would be insignificant.

This training utopia will become a reality with the AVCATT. AVCATT will be used by the company, battalion, troop, and squadron

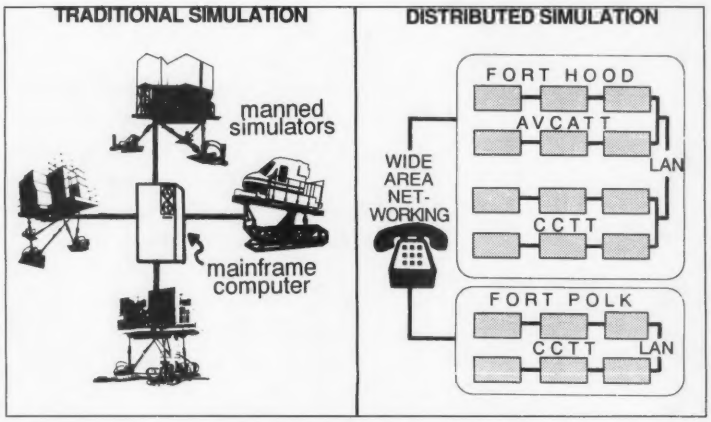


FIGURE 1: AVCATT technology comparison

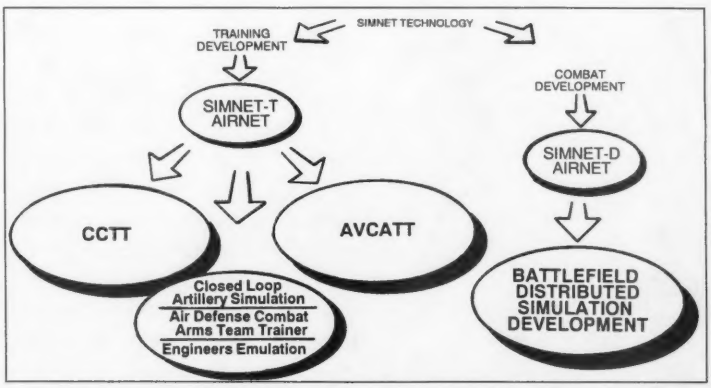


FIGURE 2: The SIMNET/AIRNET efforts during the mid-to-late 1980s demonstrated simulation potential to benefit both training and combat developers.

commanders to prepare their units for and supplement training between scheduled FTXs.

Simulators

The AVCATT system will be key to maintaining training within an established band of excellence. AVCATT is not intended to replace field training; however, it will allow units to learn how to crawl and walk in simulation. Consequently, AVCATT will make sure the greatest benefit is attained with field training dollars.

While simulation is by no means new to Army Aviation, AVCATT's distribution simulation technology is new to Army Aviation (figures 1 and 2). Distributed simulation was pioneered by the Defense Advanced Research Projects Agency (DARPA), Washington, DC, during the mid-to-late 1980s. DARPA's effort supplied 236 ground combat and eight generic rotary-wing aircraft simulators, known as simulation network (SIMNET) and air network (AIRNET), to the U.S. Army. AVCATT is now the natural evolution of these advanced technology demonstrators.

Unlike SIMNET and AIRNET, AVCATT is a requirement established by the U.S. Army Aviation Center, Fort Rucker, AL. AVCATT is based upon the needs of the scout and attack helicopter team identified repeatedly since 1978. When AVCATT is fielded, it will be a group of fully interactive network simulators and emulators replicating attack helicopter and air cavalry organizations.

The AVCATT system will be provided to installations configured as company sets. The sets will consist of subsystems: eight manned helicopter simulators; battalion staff work station subsystem; aviation emulation and support subsystem; blue-and-red semiautomated force (SAFOR) subsystem; after-action review (AAR) subsystem; and local area computer network (figure 3).

AVCATT will allow units to conduct collective task training in

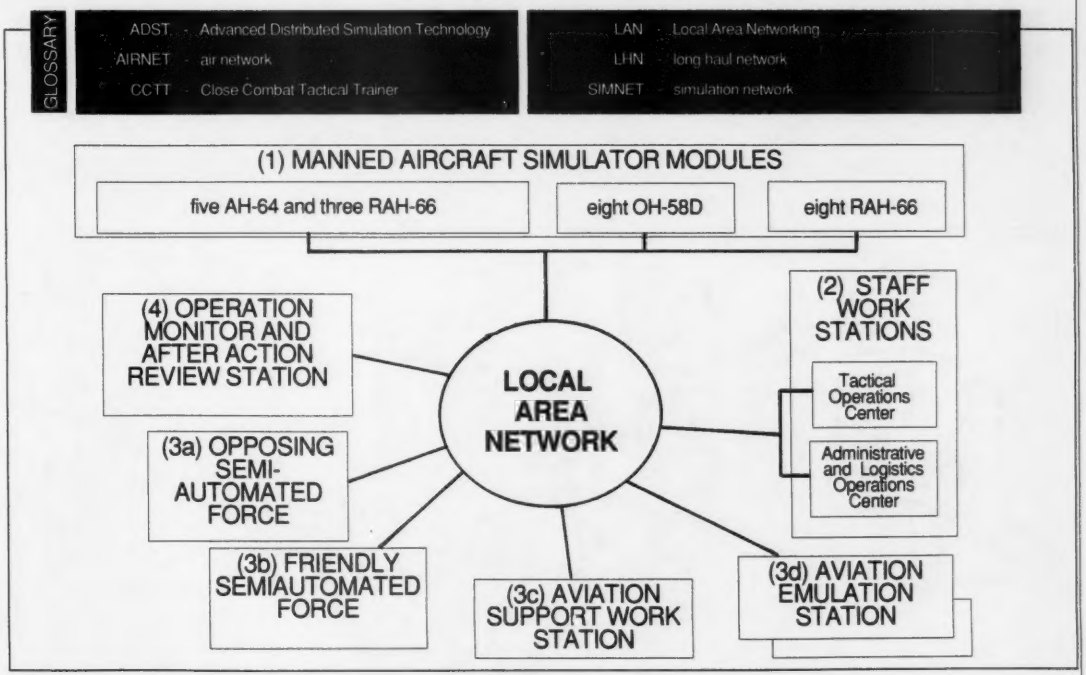

GLOSSARY
ADST - Advanced Distributed Simulation Technology
AIRNET - air network
CCTT - Close Combat Tactical Trainer
LAN - Local Area Networking
LHN - long haul network
SIMNET - simulation network
(1) MANNED AIRCRAFT SIMULATOR MODULES
five AH-64 and three RAH-66
eight OH-58D
eight RAH-66
(2) STAFF WORK STATIONS
Tactical Operations Center
Administrative and Logistics Operations Center
(4) OPERATION MONITOR AND AFTER ACTION REVIEW STATION
LOCAL AREA NETWORK
(3a) OPPOSING SEMI-AUTOMATED FORCE
(3b) FRIENDLY SEMIAUTOMATED FORCE
(3c) AVIATION SUPPORT WORK STATION
(3d) AVIATION EMULATION STATION

FIGURE 3: The local area computer network is one subsystem in the AVCATT Company Set.

real time, on a computer-generated battlefield, using combined arms, force-on-force, free play training scenarios. Manned simulators in AVCATT will replicate the cockpits of the AH-64 Apache, the RAH-66 Comanche, and the OH-58D Armed Kiowa. Opposing forces are provided by SAFOR work stations. Other elements present on the modern battlefield, such as combat support and combat service support, are emulated as part of the simulation.

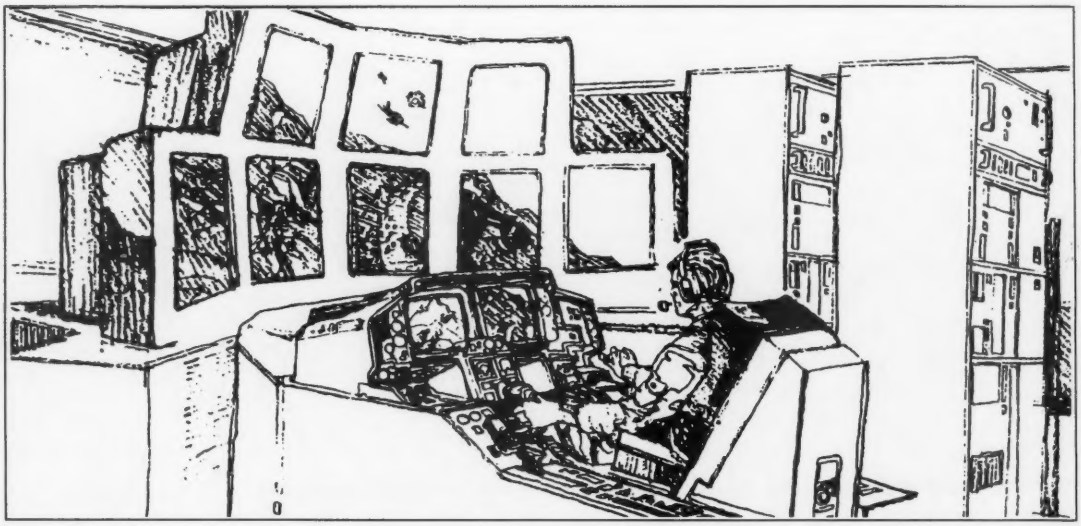
In AVCATT, aircrews will experience the cockpit, flight characteristics, and weapons characteristics to the degree necessary to conduct successful unit-level collective task training. This concept is referred to as selected fidelity.

Each aircraft cockpit is connected to the local area network, allowing each aircrew to interact with each other and the total AVCATT environment. Examples of the AVCATT environment are battalion tactical operations center (TOC)/administrative and logistics operations center (ALOC); friendly ground forces (SAFOR); opposing forces (SAFOR); and adjacent units (aviation emulation station). Therefore, warfighting takes place within the confines of an environment created by software and portrayed by computer image generators (CIGs).

These simulators differ from traditional flight simulators, because each one comprises a visual system containing a display device and CIG; its own microprocessor; and its own copy of the data base. Each simulator updates its copy of the data base by receiving and passing data packets across the local area network. Then the simulator can keep track of all relevant activities in the simulated environment.

AVCATT intends to be a medium to teach warfighting skills, not flying skills. As such, personnel using the device must already be qualified and proficient in their individual aircraft. In a nutshell, AVCATT manned simulators provide the company or troop the ability to shoot, move, and communicate during a computer simulated battle.

The staff work stations represent the TOC and ALOC of the higher headquarters. The TOC performs all those functions normally associated with an aviation battalion TOC. The TOC's major purpose is to drive the simulation from the top down. The



TOC will maintain communication and coordination with higher, lower, and adjacent units.

Emulators

The TOC consists of the operations, fire support, and intelligence work stations with correct communications equipment. The ALOC will be the focal point for all combat service support actions and emulate all logistical efforts within the unit. The ALOC will consist of maintenance, administrative, and supply work stations and correct communications equipment.

The SAFOR subsystem adds friendly and opposing forces, not represented by manned simulators, to the simulation. The SAFOR will perform all battlefield tasks and supporting functions that live forces can perform in the simulation with minimal human involvement.

The subsystem includes armor, infantry, artillery, air defense, engineer, aviation, air force, and naval systems expected to be encountered during the proper intensity level of conflict. Friendly and opposing forces will be represented by individual vehicles organized into units up to battalion level.

The aviation support work station allows a minimum number of personnel to provide additional aviation assets through emulation. These assets include aero-medical evacuation, air assault, air movement, special electronic mission aircraft, air rescue, and other special missions. The aviation support work station will provide the operator with an out-the-window view.

The aviation emulation station can also simulate the other companies or troops within the battalion or squadron. The aviation emulation station allows a minimum number of qualified personnel to control the movement of an aviation company-size element (attack or scout). Also, the emulation station provides the operator with one out-the-window view from any aircraft selected. Two aviation emulation stations will be part of a company set.

The AAR subsystem provides the commander or trainer with a means to monitor, record, and play back the events that take place during a unit training session. The subsystem will record unit movement, weapons engagements, hits, kills, ammunition expended, communication conversations, combat support, and combat service support operations. The AAR subsystem will provide both an audio, video, and data printout record of the training exercise to assist the commander or trainer in preparation and delivery of the AAR.

AVCATT is a critical element of the future Aviation Combined Arms Training Strategy. It provides an effective media to bridge the gap between critical training needs and resources. Twelve of 14 critical tasks identified in a recent aviation mission area battlefield development plan must be downloaded into simulation. As such, AVCATT provides the aviation commander with tools to train the unit in high payoff mission training plan tasks:

— at a cost that can be resourced
— in the environment of choice
— in complete safety

These tasks include, but are not limited to, air combat and antiarmor operations, suppression of enemy air defense, and aerial reconnaissance. AVCATT will offset limitations on the allocation and use of training ammunition.

Multiple aircrews will be able to interact while engaging multiple targets using HELLFIRE missiles. The simulation will allow units to increase their weapon proficiency while saving actual ordnance for premier large-scale training events. Use of aircraft laser rangefinder/designators will not be restricted.

Lastly, AVCATT provides the commander flexibility in tailoring the training mission to the skills of the unit.

In the future, therefore, simulations such as AVCATT will be a training necessity, not a luxury.

Operation Desert Storm was pulled together by the Army's leadership in a short period. The critical element of this success was the extraordinarily high state of training and readiness of forces available. Repeating Desert Storm in the future may be possible only because of a simulation-based training strategy and early investment in simulation hardware and software.

AVCATT will provide aviation commanders with units trained and ready to execute another Desert Storm on any future battlefield. Although AVCATT will not be a complete replacement for training with actual equipment in the field environment, it will allow units to spend their field training dollars more wisely.

AVCATT will be the classroom where company-level warfighting skills are taught, and the field will be the arena for perfecting and fine tuning those skills.

Changing of the Guard

photo by JFK SWCS Public Affairs Office

Special operations personnel rappel from a UH-1H Huey helicopter.

CW3 James D. Combs
Special Operations Aviation Safety Officer
Fort Bragg, NC

ON 1 OCTOBER 1990, Active Army Special Forces (SF) flight platoons were deactivated. The Army National Guard (ARNG) and U.S. Army Reserve (USAR) will follow in fiscal year 1993.

This marks the passing of a small, but dynamic, part of Army Aviation. First formed in the late sixties, SF flight detachments were key elements in the training of SF "A" teams.

The mission was one of general support but, in the SF environment, that meant anything and everything. Often having "to learn as you go," SF detachments were instrumental in developing new aviation tactics and concepts.

The aircraft

The aircraft used by the flight platoons were unique to this small part of the Army. Each detachment, one per Special Forces Group (SFG), was authorized two fixed-wing and four rotary-wing aircraft. Over the years, the fixed-wing aircraft included the following: U-1 Otter, U-6 Beaver, U-10A Helio Courier (one with floats), UV-18 Twin Otter, C-45 Dakota, C-47 Commando, and T-42 Cochise.

The rotary-wing aircraft included the OH-23 Raven, UH-1H Huey, OH-58A Kiowa, and MH-60A Black Hawk. The USAR and ARNG fleet included these aircraft and the C-7 Caribou. The Caribou is still assigned to the 19th and 20th SFG (turn-in is ongoing). The aircraft were acquired as the missions were developed.

The flight detachment structure was also developed to suit the mission. The detachment was organized into one composite unit, the John F. Kennedy (JFK) Center Flight Detachment. This consisted of two ta-

bles of organization and equipment units from the 5th and 7th SFG. The detachment also included a table(s) of distribution and allowances unit assigned to the center.

The JFK Flight Detachment had a headquarters element with a major as commander. The detachment included a fixed-wing platoon and a rotary-wing platoon, both with captains as platoon leaders.

The men

The men who sought assignments to these units were a "breed apart" in every sense of that phrase. The commissioned officers were captains who had prior experience as ground commanders, usually Special Forces or ranger qualified and normally combat experienced.

The warrant officers were usually ex-SF noncommissioned officers who had "seen the light," as they would like to say. However, their friends simply stated money and no rucksack had a serious influence.

The enlisted men were mechanical geniuses who could make airplanes fly with rubber bands, paper clips, and glue. Spaced into this element were supply clerks who could order whole airplanes and get them!

Most important was soldier dedication. The pilots and crew would live, sleep, and eat with the ground force. All were on parachute status and jumped with the teams from all types of aircraft.

This type of cooperation promoted relations that allowed them to fly missions with minimal planning. Also, this cooperation provided the ground commander with on-time, precise, and safe air support. This became such a good concept that the SF would authorize the award of the 5G identifier (SF qualified). Selected aviators who had already served with the SF could qualify to receive this award.

The job

Aviators in this grouping of nonstandard aircraft, nonstandard pilots, and unusual mission requirements safely flew some of the most challenging flights in Army Aviation.

Primarily operating within the United States and Canada, their missions included infiltrations; exfiltrations; resupply; message drop and retrieval; and general transport of "pigs and rice." Each SFG conducted major exercises requiring special air support.

Also, the JFK Center (the schoolhouse) required numerous missions, mostly single ship that increased at night. The short takeoff and landing capabilities of the fixed wing often meant late night landings on dirt roads and river beds. Then the helicopters would insert small groups into heavily forested areas using ropes and penetrators.

The new wave

In January 1985, the role of the flight platoons began to change. The last fixed wing, a leased Twin Otter, was turned in and the detachments exchanged their UH-1Hs for four highly modified UH-60As.

The new detachments of the lst SF at Fort Lewis, WA, and the 10th SF at Fort Devens, MA, brought the total to 16 MH-60s in all of Special Forces. The 5th SFG would later relocate to Fort Campbell, KY. The units became more oriented and began deploying outside the continental United States.

In late 1985, the detachments organized into a six-ship task force, with elements of the 5th, 7th, and 10th for the first self-deployment to Honduras. Assembling at Fort Bragg, NC, the aircraft flew nonstop to Key West, FL. After a short delay for a hurricane, the unit refueled and flew nonstop to LaCieba, Honduras. Here they supported the 7th SFG in operations in Central America.

While this was taking place in the U.S. Southern Command, the C5 crews flew the lst SFG's aircraft to Thailand. Here they supported the lst SFG operations in the Pacific Command. This included self-deployments to Korea, Malaysia, and the Philippines.

The pilots became area-oriented and improved their language capabilities. This learning was important to the relationships formed with the aviation units of the host countries.

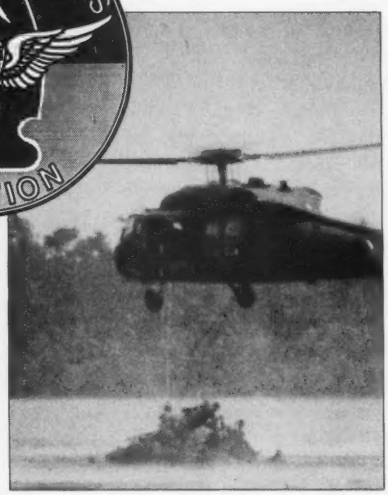
A loose relationship was formed with the then known Task Force (TF) -160. Special Forces pilots were sent through the Task Force new aviation training (the Green Platoon). Selected equipment was loaned to SF units to facilitate safe operations.

Then Major Gordon Hearnsburger, the TF-160 supply officer, was a heaven-sent angel, providing assistance when everyone else could not help. Later on, this SFG provided many good pilots for the task force.

With this new intensity of support came the difficult task of maintaining these modified aircraft. The maintenance officers of the SF detachments were already considered magicians. During this period, they also became legends. Again, the TF-160 provided assistance in a "back door" fashion. But the handwriting was on the wall. A 23-man detachment was stretched too thin to support all of the requirements of a three-battalion SFG.

In late 1988, the decision was made by the lst Special Operations Command. It decided to deactivate the flight platoons as bill payers for the growth of the 160th Special Op-

Changing of the Guard



The emblem of Special Forces Aviation represented the mission of the detachments. Gray was for the support of the Psychological Operations Groups, white for the support of the J. F. Kennedy Center (the schoolhouse), and black for support of active Special Forces groups performing real-world missions. The Army Aviator wings, overlayed on the Special Forces patch, symbolized the integration of Special Forces and aviation.

erations Aviation Group (Airborne). A smooth transition of these assets, while still providing support to the SFGs, was a critical element of that decision.

In May 1990, the 160th Special Operations Aviation Regiment (SOAR) (Airborne) was formed. The detachments began turning in their aircraft to the 245th Aviation Battalion Special Operations (Airborne) of the Oklahoma National Guard and the 3d Battalion of the 160th.

The pilots and crews didn't "fade away into the sunset." They transferred to the newly formed regiment or retired gracefully.

A few found cushy jobs in headquarters units and continued to hang around. However, a part of Army Aviation that had been on the leading edge of doctrine and training ended. The former members will always remember this as a challenging, enjoyable assignment.

Changes of the Elite Guard

As the platoons began to change their role, a new operations company was formed. The 129th Special Operations Aviation Company began to come on-line in 1987. This unit filled the holes of air support to the rangers and other special operations units.

This unit flew its 15 MH-60s from Canada to Antigua, with side trips to Norway, Spain, and England. Based in Savannah, GA, an area they do not know, they quickly earned a reputation as dedicated, mission-supportive aviators.

Initiative 17 was the agreement between Army and Air Force in 1987 that said Army would assume all rotary-wing special operations missions. When Initiative 17 was first implemented, the unit began rotating platoons into Panama to replace the Air Force rotary-wing detachment. Finally, a decision was made to permanently base an Army unit there. The 617th Special Operations Aviation Detachment was formed with five of the 129th's MH-60s.

In May 1989, the 129th was deactivated to form the 3d Battalion of the 160th SOAR. The remaining 10 Black Hawks formed A Company and an eight-ship CH-47 Chinook company formed B Company.

During the May 1990 activation of the 160th SOAR, the Black Hawks were assigned to the lst Battalion and the CH-47s became the 2d Battalion. With three battalions, two at Fort Campbell and one in Savannah, GA, the regiment became the total aviation support for the newest major Army command, the U.S. Army Special Operations Command.

Special operations forces (SOF) will always need specialized aviation support. This doesn't preclude the support of conventional Army Aviation units to the SOF. As Vietnam and other combat operations proved, Army aviators anywhere can do the job, have excellent training and have proven a total mission dedication.

However, the specialized equipment is so expensive that the Army can acquire only a small amount. Trained and equipped as no other unit can be, this "new guard" will continue the tradition of the soldier and aviator that is so important to mission success.

Hail and Farewell (Major General Ostovich), *continued from page 1*

fall of the Warsaw Pact during a period some characterized as "peace breaking out all over."

And the departure ceremonies of last summer...the anxious glance, one last hug with tearful eyes. A little girl sitting on the tarmac with her flag and a flower now lying beside her. Her head bowed...not understanding why her father must go to war again. The roar of helicopters over head, beating the air into submission as their crews break friction with the ground and fly to their destiny in the hot desert sands of Arabia.

The words of an oath "...to uphold the constitution...to defend it against all enemies..." and with the words, "Your motto is attack, your mission is to win," depart all the helicopters of our own Flying Tigers en route to a place 8,000 miles away.

The GAO report alleging our Apaches were nothing more than an expensive mistake; our troops not good enough to maintain them; our crews not able to fight them for very long. Then the gun films as those same Apaches blow a hole through the Iraqi-integrated air defenses at 5 miles range in the middle of a dark Arabian night, through which pour our combined air forces introducing Saddam Hussein to the thunder and lightning of Desert Storm.

The calm voices of Apache crews as they destroy hundreds of tanks, infantry fighting vehicles, howitzers, and trucks at ranges three times the maximum effective range of a tank gun. Our combat aviation crews ranging deep into Iraq 4 days *before* the ground offensive begins to force the surrender of hundreds of Iraqi soldiers. Yes, it was the first time since the American Indian Wars that Apaches had taken prisoners.

And then, the sounds of rotor blades approaching—returning home from war. They're all there—less one lost in a heroic attempt to rescue a downed F-16 pilot—count them still flying, still ready to go again if needed.

Listen to the words once again, "On your shoulders you carried the reputation of an army and the future of a nation." See the flags waving, the crash of emotion let loose with a run, a leap, a tearful embrace. Smell the sweet aroma of victory.

Our own Fort Rucker prisoners of war: Major Rhonda Cornum stepping out of an airplane in Riyadh, wearing yellow pajamas with two broken arms secured firmly to her front, and carrying the scars of combat into the future...a tough lady and a dedicated flight surgeon whose personal experience brings into question the traditional role of women in combat.

The million-dollar smile of SSG Stamaris, who is wearing a tattered flight suit and a proud maroon beret, clutching our American flag with one hand and saluting with the other as he is carried off the same aircraft on a stretcher.

SGT Dunlap standing tall—proud—apparently uninjured though he has just taken "one whale of a ride." A pathfinder who has lived up to the expectations of his elite order and who has seen more combat before the age of 21 than most soldiers will see in a lifetime.

The names Ortiz—Brilinski—Godfrey—Garvey—Butts—soldiers from among our number here at Fort Rucker who asked for nothing yet gave their all in the desert sands of Iraq.

The sound of taps, echoing the memory of 14 other soldiers who died in combat while doing their mission...riding the wind on rotary wings.

With these few pictures in mind, I bid you a fond farewell—soldiers at Fort Rucker and soldiers of Army Aviation around the world. Of your dedication, your departing Branch Chief could not be more proud...more proud of what *you* have done in the past 22 months of our time together.

God bless you, one and all.

ARMY AVIATION CENTER WELCO

Story and photos by Mr. Ted Walls
Writer-Editor
U.S. Army Aviation Digest

It had all the exhilarating and inspirational moments for a mid-summer morning.

Cannons roared far across the sun-warmed parade field. "America the Beautiful" resounded clearly. A UH-60 Black Hawk hovered for a rappelling demonstration. And 14 Army Aviation units passed in review.

Major General (MG) Dave Robinson assumed command of the U.S. Army Aviation Center and Fort Rucker, AL, during ceremonies 22 July at Ft. Rucker. He replaced MG Rudolph Ostovich III, who will become the new Vice Director of The Joint Staff at the Pentagon, Washington, DC, under General Colin Powell, Chairman of the Joint Chiefs of Staff.

Hundreds of attendees appreciated with pride Army Aviation at its best—the AH-64 Apache, AH-1 Cobra, UH-60 Black Hawk, OH-58 Kiowa, UH-1 Huey, and CH-47 Chinook. The helicopters flew nearby in salute to MGs Ostovich and Robinson.

ABOVE: Cannons render a salute to General John W. Foss, Commander, U.S. Army Training and Doctrine Command.

RIGHT: Observing the ceremonies are, from left, Major General Dave Robinson, new Commanding General of Fort Rucker; General John W. Foss, Commander, U.S. Army Training and Doctrine Command; and Major General Rudolph Ostovich III, former Commanding General of Fort Rucker.

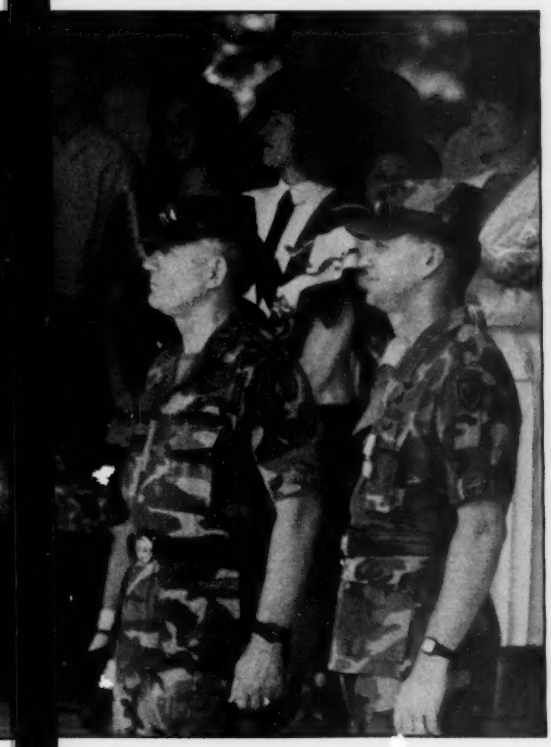
MES NEW COMMANDING GENERAL

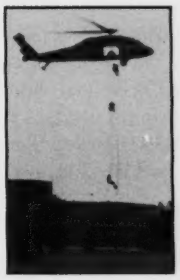
Sergeant Timothy Wells sang, "America the Beautiful." A Black Hawk then hovered to let four rappellers descend to the parade field. Two ran forward to present bouquets of summer flowers to wives Bobbi Robinson and Heidi Ostovich.

General John W. Foss, Commander, U.S. Army Training and Doctrine Command, awarded MG Ostovich the Distinguished Service Medal and awarded his wife the Outstanding Civilian Service Medal. General Foss praised MG Ostovich for a job well done.

MG Robinson previously was assigned at the Pentagon as the Director for Force Structure, Resource, and Assessment, The Joint Staff, under General Powell. He is a great believer in setting goals: "The great value of the military is you are dealing with human beings who have aspirations, goals, and desires," he says.

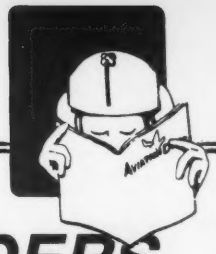
In 1962 the Robinsons first arrived on post where he was enrolled as a fixed-wing flight student. This present tour is their fifth at Fort Rucker. The Robinson family promises complete dedication to fulfill the visions the Ostovich family leave behind. The new commanding general said of Fort Rucker military and civilians, "You are truly worthy to be called, 'Above the Best.' "





A UH-60 Black Hawk hovers to let four rappellers descend to the parade field.

The Army Aviation colors are passed to signify change of command from MG Rudolph Ostovich III to MG Dave Robinson.



VIEWS FROM READERS

Editor:

The Uniformed Services University of the Health Sciences (USUHS) in Bethesda, MD, is the military's own medical school. Established by an act of Congress in 1972, this fully accredited joint-service school is designed to provide the Department of Defense with a cadre of career medical officers for the Army, Navy, Air Force, and the U.S. Public Health Service.

The medical students attending the F. Edward Hèbert School of Medicine are commissioned as ensigns or second lieutenants on active duty reserve status, and draw full military pay (about $23,000 a year) and benefits while in school. There is no tuition, and all books and equipment are provided at no charge. Students study the traditional civilian medical school curriculum plus courses of direct military medical relevance.

At graduation, medical students receive the M.D. degree and a promotion to captain or lieutenant, and must serve 7 years to pay back their education. Time spent in graduate medical education, such as an internship or residency, does not count toward the payback.

Both civilians and military personnel with a college degree may apply for the 4-year medical program at the F. Edward Hèbert School of Medicine. While civilian applicants may be no older than 27 when they enter the medical school, applicants with military service can exceed the age limit by up to 6 years—to age 33–based on the amount of their prior service. All applicants must meet the physical and personal qualifications for a commission in the uniformed services as well as certain academic requirements.

The University also has a graduate program leading to advanced degrees in the basic medical sciences that is open to both civilians and military members. Civilian students are not commissioned in one of the uniformed services. There is no tuition and most books and equipment are provided at no charge.

Graduate students serve as teaching and research assistants in efforts essential to the mission of the School of Medicine. A limited number of stipends are available for civilian graduate students.

For more information on the F. Edward Hèbert School of Medicine, contact the Office of Admissions, ATTN: Personnel Administration Center, Uniformed Services University, 4301 Jones Bridge Rd., Bethesda, MD 20814-4799, or call Commercial 202-295-3101. For more information on the graduate program, contact the Office of Graduate Education, ATTN: BH, Uniformed Services University at the same street address as above or call Commercial 202-295-3106.

Editor:

Do you have a survival story you would like to share? We are looking for people, military or civilian, who have experienced a survival episode that can be used to enhance our training. We will use your valuable experience to let others know what might be expected and how they might feel.

Please contact us at 3636 Combat Crew Training Wing/Standardization Evaluation Division, Fairchild AFB, WA 99011-6024, or phone DSN 657-2171/2176, Commercial 509-247-2171/2176.

Editor:

From 30 October to 2 November 1991 the 20th Annual P-40 Warhawk Pilots Association reunion will be held at the (Command Headquarters) El Paso Marriott, 1600 Airway Boulevard, EL Paso, TX 79925.

Contact the hotel for accommodations/reservations at Commercial 915-779-3300 or call toll free 1-800-228-9290. For detailed reunion information, contact Mr. John Roth, P-40 Reunion Chairman, 1017 Adams SE, Albuquerque, NM 87108, phone Commercial 505-268-2903.

Editor:

The Department of Social Sciences at the U.S. Military Academy, West Point, NY, is looking for highly qualified company grade Reserve Officers' Training Corps or Officer Candidate School individuals from basic yeargroups 1984 to 1991 who are interested now or may have a future interest in civilian graduate study followed by a teaching assignment at West Point.

The Department of Social Sciences educates cadets in the academic disciplines of political science (American and International), economics, and management.

The Department's selection process is exceptionally competitive and requires early application; therefore, it is never too early to begin the application process. Applications are now being considered for officers who might be available to start graduate study in the summer of 1993 or later. Applications for officers in the 1992 yeargroup must be complete, including reported Graduate Record Examination or Graduate Management Admission Test scores, not later that 1 March 1992.

Interested officers must be branch-qualified by the time they intend to begin graduate school, demonstrate strong long-term military potential and have undergraduate records that indicate they can gain admission and successfully complete graduate study at a top American university.

For more information please write to the Department of Social Sciences, U.S. Military Academy, ATTN: Major Joseph Nunez, West Point, NY 10996.

Editor:

The Senior Officer Logistics Management Course (SOLMC) is specifically designed to update battalion-level and brigade-level commanders, and their primary staffs in the logistics arena, on maintenance, supply, and transportation procedures. The curriculum also includes hands-on experience with vehicles; weapons; ammunition; medical; communications; nuclear, biological, and chemical; and quartermaster equipment.

The course is open to Majors, or officers above that grade, in the Active and Reserve Army, U.S. Marine Corps, or Allied armies, and Department of Defense civilians, GS-11 or above. The 1-week course is conducted 10 times each fiscal year at Ft. Knox, KY. Class quotas may be obtained from U.S. Army Training and Doctrine Command channels.

For more information contact CPT Hammerle, DSN 464-7133 and 464-3411, or Commercial 502-624-7133/3411.

SENIOR OFFICER LOGISTICS MANAGEMENT COURSE SCHEDULE
Course Number (No.) 8A-F23

class	reporting date	starting date	ending date
1	6 Oct 91	7 Oct 91	11 Oct 91
2	5 Jan 92	6 Jan 92	10 Jan 92
3	26 Jan 92	27 Jan 92	31Jan 92
4	1 Mar 92	2 Mar 92	6 Mar 92
5	29 Mar 92	30 Mar 92	3 Apr 92
6	5 Apr 92	6 Apr 92	10 Apr 92
7	26 Apr 92	27 Apr 92	1 May 92
8	10 May 92	11 May 92	15 May 92
9	14 Jun 92	15 Jun 92	19 Jun 92
10	20 Sep 92	21 Sep 92	25 Sep 92

Readers can obtain copies of the material that is printed in any issue by writing to:
Editor, U.S. Army Aviation Digest, ATZQ-APD, Fort Rucker, AL 36362-5042.

AVIATION PERSONNEL NOTES

Civilian Integration Into the Personnel Proponency System (CIPPS)

CIPPS is the acronym for one of our newest and most significant programs. It resulted from the Civilian Personnel Modernization Project recommendations to the Army Chief of Staff in 1987. Following a 2-year pilot program by 14 volunteer proponents, including the Aviation Branch, the program was approved for implementation Armywide in the spring of 1991.

The overall goal is to use the Army Personnel Proponent System to integrate the civilian work force, thereby creating a true Total Army Structure. The pilot study showed that there are many facets of the ongoing personnel proponency system in which civilians can participate with immediate benefits in efficiency and dollars realized. Essentially, the civilian system will, in the future, more closely resemble the military personnel system. This affirms the total Army principle of one integrated force and will promote greater understanding of both personnel systems. The end results will include better trained, better managed, and higher quality employees and managers. The competence and confidence of the leadership will lead directly to a higher state of readiness for the downsized Army of the future.

At present about 25 percent of civilian employees are managed in career programs, but not as intensively as a career field is managed. The CIPPS will ultimately place every civilian employee in one of the newly created career fields. The Aviation Branch will manage at least two of these new career fields for civilians. See your local Civilian Personnel Office for details on how it may affect you and your unit. For particulars on Aviation Career Fields for civilians, write Commander, U.S. Army Aviation Center, ATTN: ATZQ-APP, Fort Rucker, AL 36362-5036 or call Mr. Charles F. Auman, DSN 558-4313/5706 or commercial (205) 255-4313/5706.

Married Army Couples Program (MACP)

Many Army soldiers marry other soldiers. To ensure that they increase their opportunity to serve together, it is important to understand clearly how the Married Army Couples Program (MACP) works. There have been many cases where soldiers were not properly enrolled in this important program. This article should clear up any confusion you might have about the MACP.

The MACP pertains to all Regular Army soldiers who are married to other Regular Army soldiers. Soldiers must enroll in the program within 60 days after marriage. They cannot wait until assignment instructions (AIs) have been issued to one member to enroll.

Enrolling in the system is easy. Both soldiers submit separate DA Forms 4187 to their respective Personnel Service Centers (PSCs). If both are serviced by the same PSC, then only one submission is required. Your career branch does not have the capability to enroll you in the MACP.

Failure to enroll indicates the soldiers do not want consideration for joint domicile assignments. Enrollment in the MACP does not ensure soldiers will be assigned to the same location, but it significantly improves their chances. U.S. Total Army Personnel Command (PERSCOM), Alexandria, VA, makes every effort to consider the needs of the individual and keeps couples together. However, the needs of the Army are paramount.

If soldiers want to be removed from the program because they no longer desire consideration for joint domicile, they use the same procedure as they did to enroll. Removal is not automatic upon separation or divorce.

This is how the system works. If soldiers are enrolled in the MACP, their records will reflect that when they are being considered for reassignment. If a valid vacancy exists for the spouse in the same location or within a 50-mile radius, a joint domicile assignment is granted. It is a little more complicated for soldiers on assignment instructions to Germany or Korea.

A Joint domicile assignment to Europe is coordinated with the European Liaison Office, PERSCOM. The overseas command notifies PERSCOM of the approval or disapproval of the joint domicile. This process takes approximately 60 to 90 days.

Your career branch assigns soldiers to Korea when a requirement exists, and they are the most eligible. The branch does not make any joint domicile decisions. The soldier's local PSC contacts Korea and requests a joint domicile assignment, and Korea makes the final decision.

Remember, if a valid vacancy does not exist to accommodate a joint domicile, the soldier selected for assignment will remain on assignment instructions. In other words, you will not be deleted because your joint domicile was disapproved. In all cases, the needs of the Army are the determining factors.

READER SURVEY

The *Aviation Digest* staff wants you, the reader, to have a thought-provoking publication, one that inspires your comments, pro or con. The staff wants to continue publishing such a viable and essential aviation-related publication.

One way the *Aviation Digest* staff can receive and then respond to your comments is with this Reader Survey. The survey allows us to communicate directly with you. We are here to help you become more productive on your job and have a greater appreciation and understanding not only of Army Aviation, but yourself and fellow employees.

With your help, our staff will have a better opportunity to publish the types of stories you, the reader, want to read and so very much deserve.

Let's share information and ideas. We will use your answers as a guide for us to publish the best possible aviation-related stories.

Please take the few minutes necessary to complete, tear out, and return the survey to ***Aviation Digest***, ATZQ-APD, Ft. Rucker, AL 36362-5042. The ***Aviation Digest*** staff will treat your individual responses as confidential, so be as candid as you wish.

Directions: Circle letters to indicate your response, preferably using a ballpoint pen.

For mailing, fold, staple, and affix a stamp on the address side of the mailer.

Please respond by 1 November.

FREQUENCY

1. Have you looked at an issue of *Aviation Digest* in the past year ?

a. No b. Yes

2. How many issues of *Aviation Digest* published this past year have you read ?

a. One b. Two c. Three

d. Four e. Five f. All six

3. How much of each issue do you read ?

a. Almost none b. Less than half c. More than half d. All or almost all

4. How do you usually get a copy of the *Aviation Digest* ?

a. Unit b. Office c. Dayroom d. Library e. Learning or education center

f. Paid subscription mailed to me g. Someone else's office or location

h. Other _____

5. How soon do you receive the *Aviation Digest* after the bimonthly publication date ?

a. Same month b. One month later

c. Two months later d. More than two months later

6. In your opinion, how often should the Aviation Branch publish the *Aviation Digest* ?

a. Bimonthly b. Monthly c. Quarterly d. Never

7. What do you do with the *Aviation Digest* after you read it ?

a. Throw it away b. Give it to someone else c. Take it home and save it

d. Clip out stories for reference e. Route it through the unit or office

f. Use it for reports, papers, or briefings g. Leave it in the dayroom, library, or office

h. Other _____

8. How often do you take the *Aviation Digest* home to use as a family periodical or publication?

a. Never b. Seldom c. Sometimes d. All the time

USEFULNESS

9. For each of these statements, circle the letter that most nearly describes your feeling about the *Aviation Digest* (*a = strongly agree; b = agree; c = neutral; d = disagree; e = strongly disagree*).

easy to read	a	b	c	d	e
well written	a	b	c	d	e
easy to understand	a	b	c	d	e
interesting information	a	b	c	d	e
information makes me think	a	b	c	d	e
new and useful information	a	b	c	d	e
provides reference material	a	b	c	d	e
information helps me on the job	a	b	c	d	e

10. How helpful is *Aviation Digest* in keeping you informed and up-to-date on changes and developments in Army Aviation ?

a. Extremely helpful b. Very helpful c. Helpful

d. Moderately helpful e. Not helpful f. Difficult to tell

11. Over the past 12 months, have the suggestions, ideas, or information in the *Aviation Digest* helped you to better understand your job, improve your performance, or solve aviation-related problems ?

a. Seldom b. Sometimes c. Frequently

d. Very frequently e. Not at all f. Difficult to tell

12. How helpful are the department stories? Department stories, normally printed in every publication, keep the same titles. Department titles include CG's Page One, ATC Focus, Aviation Logistics, Aviation Medicine Report, AVSCOM, DES Report to the Field, Personnel Notes, USAASA Sez, Combat Training Center Corner, TEXCOM, and Aviation Branch Safety Office.

a. Not helpful b. Helpful c. Very helpful d. Difficult to tell

13. How do you feel about the length of the department stories?

a. Too long b. Just right c. Too short d. Never noticed

14. How do you find the length of other articles (not department stories) ?

a. Too long b. Just right c. Too short d. Never noticed

15. Overall, how do you consider the usefulness of the *Aviation Digest* ?

a. A valuable publication b. A useful publication c. Interesting, but not useful

d. No value e. Difficult to tell

CONTENT

16. Would you like to read more or fewer stories that relate to these aviation subjects ?

Safety	more	fewer
Supply	more	fewer
History	more	fewer
Tactics	more	fewer
Doctrine	more	fewer
Training	more	fewer
Maintenance	more	fewer
National Guard	more	fewer
Transportation	more	fewer
Desert survival	more	fewer
Joint operations	more	fewer
Reserve components	more	fewer
Professional development	more	fewer
Recruiting and retention	more	fewer
Acquisition and procurement	more	fewer

17. Now after this question, please list any other subjects or types of stories you would like to read in the *Aviation Digest*.

_____

_____

_____

18. How do you think the content of the *Aviation Digest* compares with other military publications ?

a. One of the best b. Better than most c. Average

d. Poorer than most e. One of the worst f. I have no basis for comparison

VISUAL APPEARANCE

19. For each of these statements about the visual appearance of the *Aviation Digest*, circle the letter that most nearly describes your feeling (a = strongly agree; b = agree; c = neutral; d = disagree; e = strongly disagree).

Type is clear, easy to read	a	b	c	d	e
Illustrations are helpful, appropriate	a	b	c	d	e
Photos are interesting, informative	a	b	c	d	e
Cover is attractive, gets my attention	a	b	c	d	e
Charts and graphs are easily understood and helpful	a	b	c	d	e

20. Overall, how would you rate the content, appearance, look, and design of the *Aviation Digest* ?

a. Poor b. Fair c. Good d. Very good e. Excellent

21. How do you think the visual appearance of the *Aviation Digest* compares with other military publications ?

a. One of the best b. Better than most c. Average

d. Poorer than most e. One of the worst f. I have no basis for comparison

INDIVIDUAL STATUS

22. Where are you stationed ?

a. Alaska b. Europe c. Hawaii d. Middle East e. Pacific or Far East

f. Continental United States g. Panama, Caribbean, or Latin America

h. Other (geographic area) _____

23. What is your status?

a. Retired b. Army Reserve c. Civil Service d. Contract Civilian e. Army National Guard

f. Active (My rank is _____)

g. Other (please specify) _____

24. What is your age group ?

a. Under 20 b. 20-29 c. 30-39 d. 40-49 e. 50 or over

25. What is your education level ?

a. Less than high school b. High school or GED

c. Some college, no degree d. Associate degree or technical certificate

e. Bachelor's degree f. Master's degree g. Doctoral degree

The ***Aviation Digest*** thanks you for taking time to complete and return this survey. Your ideas and comments are as important to us as your answers to our questions. Therefore, please use this space (plus additional pages, if needed) to share some of your ideas and comments.

ARMY AVIATION MOTTO

For 25 years, "ABOVE THE BEST" has been the motto for the U.S. Army Aviation Center (USAAVNC). However, the Army Aviation Branch itself, which became a branch in 1983, has not had a motto, even though the branch has used ABOVE THE BEST as if it were its motto.

Because ABOVE THE BEST is the name of the Aviation Branch song, and because 1992 is the 50th anniversary of Army Aviation, the Aviation Branch is proposing to adopt ABOVE THE BEST as its official motto. But, what do you think? We are asking you, the ***Aviation Digest*** reader, to give us your opinion.

25. Do you like the proposed Army Aviation Branch motto, "ABOVE THE BEST"?_____

26. If you have another choice for a motto, please give us your suggestion:

"_____"

U.S. ARMY AVIATION DIGEST
ATZQ-APD
FORT RUCKER, ALABAMA
36362-5042

Depot Automated Pilot Overhaul Program (DAPOP)

Mr. George Humphries
Directorate for Maintenance
U.S. Army Aviation Systems Command
St. Louis, MO

Initial Contract Depot Maintenance Support

When a new aircraft or helicopter system is introduced into the Army inventory, most of the depot level repair of its components and assemblies is provided by one or more contractors.

Meanwhile, the Army must prepare appropriate Army (organic) depots to take over the repair and overhaul of these items from the contractors.

This is not always an easy task when you consider the growing sophistication and complexity of assemblies and systems used on modern Army aircraft. These assemblies and systems include turbine engines, integrated electronic systems, hydraulic and electronic controls, computer systems, avionics, instrumentation, and rotor systems.

Preparing an Army operated depot, with the necessary overhaul abilities, can be an involved process. The following list, though incomplete, represents what an Army depot needs before actual overhaul programs can start in earnest—

❑ A detailed manual or Depot Maintenance Work Requirement (DMWR) of what must be done to the component during depot repair and how to do it, is required. This manual will always spell out inspection and test requirements for the component during the repair process.

❑ Depot Maintenance Plant Equipment (DMPE). The DMPE consists of a wide range of special tools, holding and alignment fixtures, and functional test stands. The DMPE also has a variety of general and special facilities, such as an aircraft painting and turbine engine runup and test facility.

❑ Repair (spare) parts are essential, down to the right screws.

❑ All appropriate technical data, specifications, engineering drawings, etc., which show correct measurements, pressures, temperatures or functional limits required during all phases of repair and testing, are required.

❑ The last need is a wide range of qualified people possessing all the necessary skills to properly repair and overhaul the item. Occasionally, a special local training program will be necessary on items requiring new or sophisticated skills.

DAPOP in Action

DAPOP is a relatively new form of computer-aided logistics schedules derived from a combination of the Commodity Command Supply System and the Depot Maintenance Requirements System databases, along with other select preanalyzed data. This information is placed into a user-friendly database system. The DAPOP database is operated with a menu-driven program for each weapons system and can present information to management in a common sense format, accommodating easy decisionmaking.

The AVSCOM DAPOP system has been installed at the U.S. Army Depot System Command (DESCOM), Chambersburg, Pennsylvania, and at Corpus Christi Army Depot (CCAD), Corpus Christi, Texas, for daily use. This computer network allows routine exchange of DAPOP data and periodic system updates from AVSCOM.

Figure 1 is a DAPOP Worksheet containing the essential elements of data necessary to manage events leading up to a "Pilot" or Test Overhaul. The data are updated as often as necessary and are available to all elements in the DAPOP network. For more information about the DAPOP Worksheet, contact Directorate for Maintainance, AVSCOM, ATTN: AMSAV-MPE, St. Louis, MO 63170-1798 (DSN 693-1164).

The DAPOP Worksheet is a summary display of related data and information necessary to manage the six major primary drivers dominating depot repair capability planning. These drivers include an item being overhauled by a contractor, a repair procedure, repair parts, tools and equipment, people (training/facilities), and detailed item specifications.

The DMPE Saga

One unforgiving element of the DAPOP story focuses around Depot Maintenance Plant Equipment (DMPE). When all other elements fall into place and there is a shortfall in DMPE, seldom does the program work.

Although all the other DAPOP elements may have shortfalls, none have the potential and far-reaching impact as a shortage of DMPE. DMPE can be extremely expensive and scarce, with many tailored items which may take a long time to produce. Seldom are DMPE items stocked in the supply system, since

FIGURE 1: DAPOP management worksheet

CH-47D DEPOT AUTOMATED PILOT OVERHAUL PROGRAM

Sequence: DMWR/RPID — As of 15/07/91

Fan VANEAXIAL — DMWR 55-3215-75

TRANSITION SCHEDULE SECTION

DMWR Avail.	DMPE Avail.	MRL Avail.	Parts Avail.	Trng. Comp.	Pilot	Trans.	Pr. Dep.
92Q3	93Q3	92Q4	93Q3	93Q4	94Q1	95Q1	J3

REQUIREMENTS IDENTIFICATION SECTION

MGR: BKR22

RPID (Prime Item): 3215-00-121-XXX

AMC PRON	NSN	PART NUMBER	CAGE	DCI	IMPC	WAS	PA	OUT	FY90	FY91	FY92	FY93	FY94
	3215-00-121-xxxx	12345-15	58163	C	1A	A1	J3	Y	7	7	7	7	7

SUPPLY STATUS/PRICE/PRIORITY SECTION

SMR	FSP	Due In	Due out	AMD	Serv.	Unsv.	Unit Price	Impact Cat.
CPAOD	Y	NONE	0	0.55	15	7	3630.00	MED

Remarks: ENTRIES ARE FICTICIOUS

the number of DMPE items needed are limited. DMPE must be in place at the right time and at the right depot! Figure 2 is a T-800 Engine Test Analyzer. It is a typical piece of equipment used in DMPE.

We also employ a DMPE Management Sheet, in conjunction with the DAPOP Management Sheet. This management sheet is a necessary page in the DAPOP scheme. It contains a listing of all the DMPE items shown in the DMWR repair procedure. It also contains information on each DMPE item, such as item name, national stock number/part number, item cost, manufacturer, availability of manufacturing specifications, and DMPE assets available at the target depot.

FIGURE 2: T-800 engine test analyzer

Cost Avoidance

The Government organic depot and commercial overhaul contracts amounted to $563 million in 1990. The newly created AVSCOM Depot Planning Section, with its new DAPOP, contributed to the government in a cost avoidance of $89 million. Another benefit is a contribution to improved aircraft readiness, because of the shorter time needed to replenish stocks of serviceable items for the customer—you.

Hail and Farewell, *Major General Dave Robinson,* *continued from page 1*

Second, Aviation's focus must remain centered on closing with and destroying the enemy as part of the combined arms team. Every aviation leader must be able to integrate forces on the battlefield.

Third, we must find the best way to mobilize, deploy, fight, and sustain the force. Warfighting concepts must be confirmed and the complementing role of Active and Reserve Components examined; we must seek areas where our structure may be too robust or too shallow for future missions.

Fourth, we cannot break faith with our dedicated aviation professionals. Force reductions must be sensible and designed to retain and attract young Americans for the high-technology skills needed in the residual force. We must find ways to protect our precious resources through quality maintenance, aggressive safety programs, and other efficiencies to garner maximum advantage from aviation resources.

We have decisively proven what we can do. Let us now build on Army Aviation's remarkable past achievements and improve our capabilities in light of a greatly changing world. I look forward to facing these challenges with you and am confident in our ability to succeed.

USAASA SEZ
U.S. Army Aeronautical Services Agency

How to Operate in NAS: A Few Pointers

Mr. Terry Van Steenbergen
Air Traffic Control Specialist
U.S. Army Aeronautical Services Agency
Cameron Station
Alexandria, VA

HOW WELL DO you operate in the National Airspace System (NAS)? Let's assume you are involved in "Operation Mythical Flight," and you are planning a cross-country mission to fly to a field site. The flight will be conducted using visual flight rules (VFR). After plotting your course on the VFR Sectional chart, you notice that you will be operating in or near various types of airspace. Has your experience or training equipped you with the knowledge necessary to operate in accordance with Federal law, in an Army aircraft, in the NAS?

Let's look at some airspace you may encounter on "Operation Mythical Flight." This article will provide some facts that might help you complete the flight without being flight-violated or run over by someone.

Airport Radar Service Area (ARSA). You should be in contact with air traffic control (ATC) before entering and while operating in the ARSA. Here is a quote from Federal Aviation Administration (FAA) Order 7110.65F: "If a controller responds to a radio call with '(a/c callsign) standby,' radio communications have been established and the pilot can enter the ARSA." You will not need a transponder with mode C in an Army aircraft until 1 October 1992. However, you may need to coordinate with the primary ATC facility operating the airspace. Participation in the radar service is not mandatory, but the FAA will want to communicate with your aircraft and give you air traffic advisories.

Terminal Control Area (TCA). You must obtain permission before entering a TCA. Radio contact is not an authorization to enter the TCA. Pilots have been flight-violated because they were talking to ATC as they entered the TCA, but ATC did not specifically clear the aircraft to enter the TCA. Make sure it is clearly stated that you are cleared to enter the TCA. The transponder requirement for TCA operations is the same as ARSA.

Control Zone. If you are operating in a VFR control zone that does not have an operating control tower, you are not required to obtain

permission to operate in that airspace. The control zone protects instrument flight rules (IFR) aircraft from other IFR aircraft on instrument approaches/departures at that airport. If you encounter one of these IFR aircraft while you are VFR, you will use normal right-of-way rules.

Airport Traffic Area (ATA). If you arrive at or depart the primary airport in an airport traffic area or transition through the area, you should communicate with the control tower. If you arrive at or depart a satellite airport in the ATA, you will not be required to communicate with the control tower. However, if your workload permits, you should inform the tower of your presence and intentions.

Restricted Area. If you know how to deal with a restricted area, you may save some time on your flight. You should contact the controlling agency for the restricted area to see if the using agency has released use of the area. The controlling agency is listed in the margin of the sectional chart. If that area is not active, you may operate through or over the area and save many miles of unnecessary flight. The using agency actually owns that airspace and releases it to the controlling agency when it is not in use.

Military Operations Area (MOA). You may operate directly through a military operations area. But you should be aware that authorized MOA aircraft may be operating in excess of 250 knots, and they may be conducting aerobatic maneuvers. If you decide to operate within an active MOA, you should stay extremely alert with your eyes focused outside the cockpit.

Alert Area. This is another area where you should keep your attention directed outside the aircraft. Alert areas are established to advertise heavy student pilot activity or unusual activity that tends to reduce the vigilance of the alert area's participating aircraft.

Warning Area. These areas are normally offshore, and Army aircraft will not encounter them very often. If you need to operate in a warning area, contact the controlling agency to determine what activity is being conducted. Activities conducted in a warning area are similar to those conducted in a restricted area and an MOA.

Visual Route (VR). Visual routes are established by the Air Force/Navy/Marines to allow aircraft to operate during VFR conditions, at speeds in excess of 250 knots, and along a charted route. When you cross these routes, you should know the location and route of these aircraft.

IFR Route (IR). IFR routes are just like VRs, except they allow aircraft to fly fast along the route. If you are VFR, you should be looking up the IR to see what is heading your way.

Before operating outside your normal installation airspace environment, on a mission other than a mythical flight, please learn more about the various types of airspace and the procedures for their use. If you need more information on airspace, contact your post Air Traffic and Airspace (AT&A) Officer, ATC personnel, Range Officer, Department of the Army Regional FFA Representative, or call the U.S. Army Aeronautical Services Agency. It is important for you to operate safely and efficiently in the NAS.

USAASA invites your questions and comments and may be contacted at DSN 284-7773.

Aviation Deep Battle Operations at the National Training Center

Major Robert W. Soniak
Attack Helicopter Operations Trainer
National Training Center
Fort Irwin, CA

TRENDS SUGGEST THERE are three keys to successful aviation deep battle operations at the National Training Center (NTC). They are reconnaissance, fire support, and mass. Whether on the offense or defense, these three principles must be followed to execute successful deep battle operations.

Don't become preoccupied with the definition of deep battle operations. Current land management restrictions and Opposing Forces (OPFOR) scenario development usually place deep battle operations 10-20 kilometers forward of the forward line of own troops (FLOT). With the OPFOR moving at 20 kilometers per hour, the window of opportunity for the aviation task force to execute deep battle operations may be small.

Reconnaissance

The first key to successful deep battle operations is reconnaissance. Reconnaissance is divided into two phases–the counterreconnaissance phase and the main battle phase.

Counterreconnaissance Phase. During the counterreconnaissance phase the aviation task force must help the brigade combat team (BCT) identify and destroy all OPFOR reconnaissance. It should not be bypassed, reported, or observed. It should be de-

stroyed. When allowed to operate safely in sector, OPFOR reconnaissance will cause considerable problems during the main battle phase. Given time, OPFOR reconnaissance will identify friendly positions and report locations and unit strengths in the task force/brigade sector. Their presence also will result in unsecured flight routes, holding areas, and aviation battle positions.

An effective technique used to destroy OPFOR reconnaissance is for the BCT to integrate the aviation task force in a thorough zone counterreconnaissance plan. This plan is conducted like a search and rescue mission. First, you divide the zone and search every square meter as if you are searching for a downed pilot. Next, you insist that the BCT assign ground units to particular zones. Finally, you direct the aviation task force scouts to coordinate with the ground units to attack OPFOR reconnaissance found in a particular zone. This is a time-consuming event. One or two OH-58 Kiowas can't cover 300-400 square kilometers thoroughly.

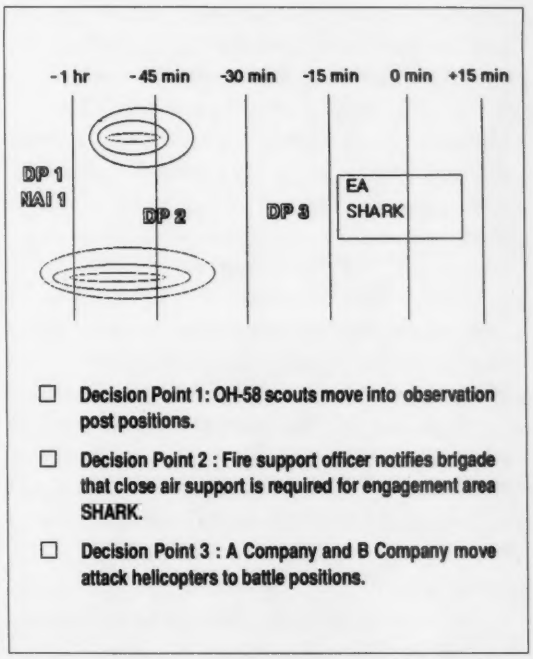
The counterreconnaissance fight is a major task force mission. Planning and home station training are essential to conduct this operation successfully. The OPFOR employ reconnaissance according to doctrine. Therefore, you must use the intelligence preparation of the battlefield (IPB) process to identify when and where they will be in sector. Remember, the focus of the counter reconnaissance battle is to kill OPFOR

A/1-12 ATTACK SCOUT/3-45 ARMOR	A/1-12 ATTACK A/3-45 ARMOR	A/1-12 ATTACK A/3-45 ARMOR
B/1-12 ATTACK A/1-55 MECHANIZED	B/1-12 ATTACK A/1-55 MECHANIZED	B/1-12 ATTACK A/1-55 MECHANIZED
C/1-12 ATTACK A/1-55 MECHANIZED	C/1-12 ATTACK C/1-55 MECHANIZED	C/1-12 ATTACK C/1-55 MECHANIZED

COUNTERRECONNAISSANCE PLAN

reconnaissance, not just report. And it's time-consuming.

Main Battle Phase. Reconnaissance during the main battle focuses on finding the enemy. You should start with a good IPB, then develop named areas of interest (NAIs) that track the enemy to your engagement areas. Some NAIs will be out of the reach and range of the aviation task force. In these cases you should request, through the brigade, that the division watch these NAIs and report priority intelligence requirements. When the enemy is approximately 1 hour from the closest NAI that can be organically observed, place your scouts to intercept them. You must ensure there is a task force plan for rotating scout assets. The


-1 hr
-45 min
-30 min
-15 min
0 min
+15 min
DP 1
NAI 1
DP 2
DP 3
EA
SHARK
☐ Decision Point 1: OH-58 scouts move into observation post positions.
☐ Decision Point 2 : Fire support officer notifies brigade that close air support is required for engagement area SHARK.
☐ Decision Point 3 : A Company and B Company move attack helicopters to battle positions.

DECISION MATRIX

S2, S3, and company commanders should brief this rotation plan at the task force rehearsal.

The OH-58C Kiowa is not always the best scout platform. However, dismounted aerial observers

should compensate for this deficiency. A dismounted aerial observer with a secure AN/PRC-77 Frequency Modulation Field Radio and binoculars usually provides more accurate information than several flying scouts observing the same NAI. In addition, a commander may choose to employ an AH-1 Cobra or AH-64 Apache to assist in the reconnaissance phase. Remember, an execution matrix should always be event driven instead of time driven. The OPFOR don't always attack at 0600 hours.

The aviation task force S2 develops and executes the collection and reconnaissance plan. All spot reports should be channeled through the aviation task force S2. Clear and concise spot reports are essential for the S2 to develop an accurate picture of what is happening. The reconnaissance/collection effort must be coordinated by the S2. For the attack battalion this may mean consolidating most of the OH-58C Kiowa scout assets into one organization to assist the collection effort. If OH-58D Kiowas are available, the S3 must decide when these assets will be most effective, either in the collection/reconnaissance mode or for assisting the fire support plan or both.

The key to reconnaissance in the main battle phase is to locate and track the enemy, which allows the task force commander to execute his engagement areas as planned. Remember, the window of opportunity may be very small; so accurate reconnaissance is essential.

Fire Support

The second key to successful deep battle operations for aviation is thorough fire support planning. It is very difficult to execute a fire support plan. The ability of the enemy to maneuver in open terrain makes them difficult to target in specific engagement areas. The IPB process should yield definite avenues of approach and mobility corridors to execute the engagement areas and the fire support plan. The aviation task force must insist that the BCT position sufficient artillery forward for deep battle operations at the maximum range of the zone of operation.

Planning. The fire support plan should be rehearsed on a sand table. When time is available, a flying rehearsal is conducted with the fire support officer (FSO) and supporting fire direction center over fire control nets dedicated for the operation. If OH-58C Kiowas execute the fire support plan, then target groups should be used instead of individual targets. Target groups are easier to identify in the desert than individual targets. If possible, target reference points should be emplaced to help crews identify the target.

Joint air attack team (JAAT) operations should be planned for specific engagement areas. Don't rely on close air support (CAS) windows. OPFOR may not be in the engagement areas when the CAS is in the windows. The BCT should allocate sorties to the aviation task force, then develop decision points ensuring that CAS is on station at the initial point (IP) and ready for use.

The air liaison officer should be included at the task force rehearsals and briefings. JAAT must be included as part of the plan and rehearsal. And a forward air controller should be there for the rehearsals. At the NTC, it usually takes about 30 to 45 minutes to get CAS on station from a cold start to the IP. You should plan your decision points to get CAS on station to execute JAAT where and when you want.

For copperhead engagements, you should confirm who will do the designating and from what position. To avoid angle-T problems, you must know the exact location of the battery that will fire the missions. A flying rehearsal to exercise digital message device traffic with the fire direction control center will eliminate surprises at the time of execution. If OH-58D Kiowas are not available, combat observation lasing teams may be brought forward to facilitate copperhead engagements. These teams should be included in your rehearsals.

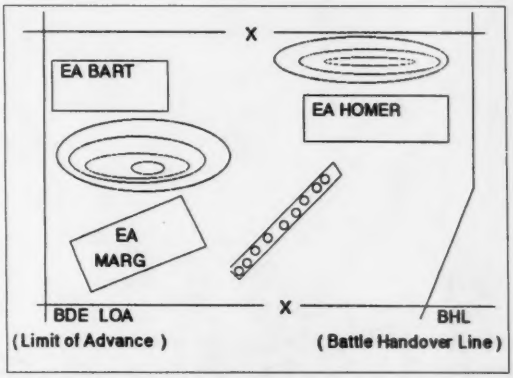
Execution. Fire support plan execution is probably the most difficult part to synchronize in deep battle operations. Ideally, the task force will have attack helicopters with CAS and artillery, simultaneously. Deep battle operations, like a symphony orchestra, need a conductor to be effective. Deep battle operations should be orchestrated at the task force level. The S2, S3, and FSO coordinate the right players into the right positions at the right time. Each company has a battle captain/crew and backups to execute the fire support plan and the JAAT.

Finally, most brigade commanders place engineering emphasis on preparing obstacles and positions for ground forces in close battle operations. If the terrain supports such activity, it may be worth while to place obstacles in the deep battle area to help direct enemy forces to engagement areas. For every vehicle killed in deep battle operations, its one less for the ground task forces to kill in close battle operations.

Mass

The final key to successful deep battle operations is mass, which is very difficult for a cavalry squadron participating at the NTC. Six to eight AH-1 Cobras don't provide sufficient mass to attrite seriously a Motorized Rifle Regiment or Samaran Mechanized Brigade in the attack or a Samaran Tank Battalion in the role of mobile reserve. By using battlefield calculus, the brigade commander gives a cavalry squadron an attack mission that the squadron can realistically accomplish.

Remember, the window of opportunity to attack may be small for an attack battalion. The center of gravity for the OPFOR is momentum. The aviation task force must start attacking enemy formations at the maximum range of the brigade zone of operations. Don't let the OPFOR gather momentum. Battle positions and enemy time in an engagement area are all variables and will drive the type of employment decision (continuous, phased, or mass destruction). A particular battle position may offer 2-3 engagements. Successful units plan alternative and subsequent battle positions that allow for maneuver, survivability, and continuous attrition.



ENGAGEMENT AREAS IN DEEP OPERATIONS

Timing. Timing is critical; timing is everything. A premature launch of attack helicopters to battle positions is a serious problem. The proper massing of attack assets at the right time and place cannot be overstated, and that brings us back to reconnaissance.

Conclusion

I deliberately limited my discussion about techniques. I did, however, mention a few like using dismounted aerial observers and developing a search-and rescue-type counterreconnaissance plan. There are many good ideas out there, but all good techniques require practice and rehearsals and home station training. The OPFOR thrive on speed, momentum, and mass. The deep battle operation is an excellent opportunity for the aviation task force to strip away the enemy's eyes, disrupt their momentum, disorganize their command and control, and enable the ground task force(s) to finish them off in bite-size pieces.

For more information contact the Eagle Team at DSN 470-4420 or write: Commander, Operations Group, ATTN: Eagle Team, National Training Center, Fort Irwin, CA 92310

The More Things Change,

The More They Stay The Same

Captain Roy R. Peters was attending the Aviation Officers Advanced Course 90-1 at Fort Rucker, AL, when he wrote this article.

Sophisticated belligerents are increasingly involved in conflicts worldwide. As attack helicopters become more effective against a variety of targets, they too will become higher priority targets for the opposition's combined arms. All elements on the combined arms battlefield are a threat to helicopters. However, because of their speed and mobility, the greatest threat is other helicopters. Helicopter air combat is inevitable.

What sort of tactics will aviators use when helicopters "mix it up" in air-to-air combat? The tactics probably will be the same ones fighter pilots have always used. The name of the game is to use surprise and speed to hit the enemy when and where he's least expecting it. Studies since World War I show 80 percent of pilots are shot down by enemies they never see.

The principles upon which today's helicopter air combat tactics are based are the same principles tested by fixed-wing aircraft in several wars. The purpose of this article

is to analyze a set of principles developed by one of the pioneers of air combat–World War I fighter leader Oswald Boelcke. Later known as "Boelcke's Dicta," his principles were among the first to be developed and disseminated.

Historical background

The French have a saying–"The more things change, the more they stay the same." Nowhere is this aphorism more apt than in the realm of air combat, fixed- or rotary-wing. Despite unimaginable advances in aircraft, weaponry, communications, and control, a surprising number of basic fighting rules have remained valid since their formulation over the trenches of France.

It was, in fact, a Frenchman who got the whole thing started. In the early months of World War I, both France and Germany put airplanes into the airspace of the other–primarily to reconnoiter and shoot reconnaissance photos.

On 5 October 1914, a French Voisin biplane came upon a German Aviatik. The Aviatik's crew paid little attention to the Voisin. The observer, Louis Quenault, fired a ring mounted machinegun and mortally damaged the German aircraft. This event was history's first air-to-air kill.

Both sides took to air combat. In only a few months the British, French, and Germans were all flying dedicated fighter aircraft whose missions were not to photograph, not to spot for artillery units, not to harass ground forces, but to attack and destroy other aircraft in flight.

In mid-1915 the Germans unveiled their revolutionary Fokker Eindecker monoplane. It was underpowered, as were all World War I aircraft; however it was agile, durable, and an excellent climber. The Eindecker was fitted with a forward-firing machinegun synchronized to avoid hitting the two-blade propeller. Serious air-to-air combat may have begun with this invention. When flown by such superb German pilot-technicians as Max Immelman and Oswald Boelcke, the Eindecker was utterly deadly.

Oswald Boelcke was World War I air combat's father. He wrote the Boelcke Dicta in 1916. The Boelcke Dicta, which follows, is an air combat principles manifesto that remains astonishingly apt today.

- ☐ Try to secure advantages before attacking. If possible, keep the sun behind you.
- ☐ Always carry through an attack when you have started it.
- ☐ Fire only at close range and only when your opponent is properly in your sights.
- ☐ Always keep your eye on your opponent, and never let yourself be deceived by ruses.
- ☐ In any form of attack it is essential to assail your opponent from behind.
- ☐ If your opponent dives on you, do not try to evade his onslaught, but fly to meet it.
- ☐ When over the enemy's lines never forget your own line of retreat.
- ☐ For the Staffel: Attack on principle in groups of four or six. When the fight breaks up into a series of single combats, take care that several do not go for one opponent.

Boelcke later formed his own hand-picked fighter squadron – Jagdstaffel 2. His pilots were all drilled in his methods. They even studied the capabilities of and flew against captured enemy aircraft. Boelcke met an uncharacteristic end in a fight with two British DH-2 fighters. He collided with his wingman as both tried to gain a shot opportunity. The master died ignoring the last of his own rules. At the time of his death in 1916, Oswald Boelcke was Germany's top scoring pilot with 40 air victories.

Analysis

Boelcke's Dicta seem very basic. However, air combat is a complex subject. The average pilot, apart from the few gifted and instinctive air fighters, finds air combat difficult to grasp. It is all fairly simple while the enemy is flying along straight and level; however, the instant he starts to maneuver, air combat becomes difficult. Boelcke's object was to give the learner, whose situational awareness was nil in most cases, a set of guidelines to enable him to survive long enough to commence the learning process. Keeping this in mind, let's take another look at Boelcke's Dicta and see how they have stood the test of time.

Try to secure advantages before attacking. If possible, keep the sun behind you. You should seek advantages in any shape or form–usually advantages of position. The reference to the sun was in those days the best way to obtain surprise by remaining unseen. Nowadays, the sun is not so important. However, remaining unseen, by whatever means, still plays a significant part. Terrain is an important aid to the low-flying helicopter pilot. The ability of U.S. helicopters to operate at night and in limited visibility also can serve as an

advantage in a potential engagement with an opponent not as well equipped. It is the wise pilot who strives to gain better position, strength of numbers, and surprise.

Always carry through an attack when you have started it. This still applies unless carrying through an attack is risking survival because of the appearance of a threat in a good attacking position. The threat can be another helicopter or a soldier with a shoulder-fired, surface-to-air missile. Aggressiveness and determination are critical attributes. Break off too early and you'll simply encourage and embolden your opponent.

Fire only at close range and only when your opponent is properly in your sights. Close range is a relative term when launching guided missiles. It remains essential to achieve a "heart of the envelope" shot. Gun attacks are far from dead. U.S. Army aviators have no option since the fitting of air-to-air missiles has been put off to a later date. Long-range hits against a surprised and nonmaneuvering target are possible. However, in a turning fight, long-range hits are difficult to achieve. The problems of deflection and trajectory pose the greatest challenges. These problems can be bypassed by simply closing to a range where they no longer matter.

Always keep your eye on your opponent, and never let yourself be deceived by ruses. This rule is still very relevant. There is no substitute for "eyeballing" the bad guy. The ruses have changed over the years. A ruse involves presenting a picture of events as they are not. The decoy has been widely used and is still a trick to be reckoned with. Today's ruses take advantage of electronic wizardry or use sophisticated maneuvers designed to "wrong foot" an opponent.

In any form of attack it is essential to assail your opponent from behind. This is still the best policy, even with the development of all-aspect missiles. You hold all the cards when you're on your opponent's "six." You have time for a good shot. Also, you are in position to follow through with guns if your missile attack should fail. Best of all, he can't shoot back.

If your opponent dives on you, do not try to evade his onslaught, but fly to meet it. The lessons of history are clear. The attack phase is the most dangerous part of air fighting and it is this phase that must be defeated. Head at your opponent, and he'll enjoy only a fleeting shot. More important, your opponent will be in front of your own "three-nine" line. You can't kill anyone behind your "three-nine" line, but he sure can kill you.

When over the enemy's lines never forget your own line of retreat. Disengagement is still a difficult operation. When the opportunity offers, it must be taken regardless of direction. This isn't a matter of simply reading the compass. It also means remaining aware of your fuel state, the possibility of enemy forces getting between you and home, and other factors.

For the Staffel: Attack on principle in groups of four or six. When the fight breaks up into a series of single combats, take care that several do not go for one opponent. The first half of this rule emphasizes that air combat requires a high degree of teamwork and mutual support. The "lone wolf" cannot survive on the modern battlefield. The second half of the rule is a reminder that an opponent cannot go unengaged. While the friendlies are busy ganging up on some individual and spending most of their time keeping out of each other's way, the enemy has time to pick his target.

Conclusion

World War I was a time of basic learning. Aviators on both sides were learning how to use a new weapon–the armed aircraft. The aviators had no historical lessons to draw on. Now, 84 years later, U.S. Army aviators find themselves in a similar situation. Helicopter air combat is inevitable on the modern battlefield.

Cases of helicopter air-to-air combat are practically unknown. Information gleaned from the Iran/Iraq conflict is still forthcoming. However, the lessons of history are clear. These lessons show us that equipment is important–but only to a point. Pilot skill, aggressiveness, and teamwork will carry the day in almost every imaginable instance. This is the essence of Boelcke's Dicta.

A-Noun:

A Theory on Staff Survival

Captain A. Timothy Saloom was assigned to the Aviation Officer Advanced Course 90-2 when he wrote this article

"TIM, YOU HAVE DONE well here as a platoon leader, but now we have more important and critical work for you to do. You have been chosen to move up to brigade and work in the S3 shop. We need someone there with a cavalry frame of mind. I expect you to watch out for the squadron while you're there and keep us informed. Remember, they can take the man out of the cavalry, but they can't take the cavalry out of the man."

I was 33 days into my fifth National Training Center (NTC) Ft. Irwin, CA, rotation. I had just completed my 18th month of staff work when those words came flooding back to me. I also remembered walking out of the squadron executive officer's office with feelings of fear and dread. Even if I used large print, I still could have written everything I knew about staff work in a caution box in the AH-1 Cobra operator's manual. I wasn't even sure what the brigade S3 shop did, and now I was a part of it. During those next 18 months, I endured the experiences and enjoyed the successes that have led me through the beginning stages of my professional development. At times I was overworked and frustrated, but I would not trade those experiences for anything. I will always remember them.

As I reflect on that time and think of the reasons for my achievements, I've concluded there were four basic elements involved in my overall success as a staff officer. These four elements are essential in what I call the "A-Noun" theory of staff survival. The "A" represents attitude. The "Noun" part of the theory is comprised of the people, places, and things that influenced my becoming an asset to the staff. I will explain how each of these elements helped my staff development. I will also cover some pitfalls that should be avoided by an officer new to staff work.

A positive attitude is probably the most important element of the theory. I have seen quite a few officers, many of whom were great platoon leaders, decide to just quit when faced with the job of becoming a staff officer. Every Army officer is going to do some form of staff work, and must do it well, to succeed in today's new and improved Army. A positive disposition goes a long way toward mission accomplishment. Instead of complaining about staff work, develop ways to learn and profit from the work you will be doing. Learning how to gain satisfaction from the work you are doing, as opposed to the work that you think you should be doing, is essential to maintaining a favorable state of mind.

There are a couple of attitudes and situations that breed unfavorable temperaments that need to be looked out for while working on staff. The first unsavory mind set that needs to be avoided is the attitude that the only reason you are on staff is to pass the time between flying assignments. This view is characterized by the unwillingness of a new staff officer to get involved. A second characteristic of this personality is a general apathy

A-Noun

toward staff work. This attitude not only affects the individual, but also the people with whom he works. This person's coworkers must complete their work and his to keep the shop flowing.

Another personality that causes disharmony in the shop is the loner. This person is concerned with his portion of the work only. A personality of this type inhibits teamwork and often causes a redundancy in efforts. A loner's coworkers may work on the same tasks that he is working on without a unity of effort that would save man hours and resources.

The situations that are conducive to the development of negative attitudes usually occur just before the beginning and ending of field problems. Before the beginning of the problem, there is usually chaos as plans are being changed and updated. This confusion and increase in workload leads to frustration and stress that foster poor dispositions. Just before the end of a field problem that same brand of chaos is back, but now it is being magnified by exhaustion and the desire to get home.

Gaining and maintaining an optimistic view of staff work is not easy, but it is necessary. Recognizing potential negative attitudes and dealing with the situations that cause unfavorable temperaments are the first steps in the A-Noun theory.

The first part of the Noun segment of the theory is made up of people. The people who influence an individual's work are his subordinates, his superiors, and his coworkers.

Subordinates are the people who work for you. They are your clerks, computer operators, and drivers. Treat these people as you would want to be treated if you had their job. They know their work and, just like you, they resent being micromanaged. Provide subordinates with guidance, and give them the chance to excel. When a subordinate starts to fail, provide him with direction and then let him work out the problem. Letting him complete the project demonstrates your confidence in his abilities and builds self-respect.

Keeping your workers informed is important. If they know why they are staying late and the importance of the work they are doing, they will be more productive. Even in the field, subordinates appreciate being kept informed. If there is time, brief everyone on administrative and tactical plans. Conducting these briefings develops a sense of purpose and unity among the troops.

Superiors are the people for whom you work. They are the teachers, coaches, and mentors for your professional development. An officer must rely on this group for leadership to complete missions properly. Supervisors may task you with a project you can't complete. When this happens, take the guidance you have received to complete all the work that you can. The work that you accomplish is leading to the completion of the mission. A good supervisor will then step in and provide further direction and assistance to finish the work. Knowing when to provide this aid can be difficult for your supervisor to discern. When he steps in too early, he risks destroying the self-confidence of his subordinates. If he intervenes too late, he risks a missed suspense. We, as subordinates, are the key to solving this dilemma. We need to take every project we can, and work until we have completed as much as possible for our position, rank, and experience level. When you have done all you can on the project, then go to your superior for assistance. Brief your superior on the mission, what work has been done, what work is left to be done, and any recommendations that you have. Providing recommendations establishes a base of ideas for your supervisor to work from when he provides you with assistance.

Coworkers comprise the last group of people who influences a staff officer's development. Colleagues supply three elements in a staff shop. These elements are ideas, help, and maintenance of mental health.

Peers are the first resource to use to gain ideas on how to complete the mission within the supervisor's guidelines. Many of these people have worked on projects similar to yours and can provide advice to you. Coworkers also function as sounding boards for ideas and can objectively point to problems that you may have overlooked because of your closeness to the idea.

In a smooth-flowing shop, teamwork is essential. Everyone needs to pitch in and help with short-suspense and work-intensive projects. This assistance prohibits one person from being overworked.

The last thing that peers do is help maintain a team member's mental health. These are the only people with whom you can discuss the negative aspects of your job. If you discuss these aspects with superiors, you risk losing your supervisor's confidence. If you discuss these negative aspects with subordinates, you will destroy their motivation. Coworkers experience the same types of frustration and setbacks you experience, and are more likely to understand your problems. As a team, a shop needs to look out for each member. Recognizing potential motivational problem areas and striving to eliminate the sources of these hazards are the most important functions of coworkers.

The next part of the A-Noun theory is comprised of the places a staff officer goes to increase his value to the staff. These places can be geographical in nature or job related.

Geographical environments like Honduras, Panama, and Korea provide valuable staff training opportunities. NTC and return of forces to Germany rotations also provide extensive and intensive training. Each of these areas has unique characteristics involved in staff planning and work that can't be experienced anywhere else.

The places element of the program also includes where your work takes you. An example of this would be a liaison officer working at the division or maneuver brigade's headquarters. Liaison work requires the officer to become intimately familiar with the operations of the unit he represents. The liaison officer is the subject matter expert of his unit's capabilities to the headquarters to which he is assigned and is relied upon for accurate information. Working as a liaison officer may also lend insight as to how other staffs solve problems commonly encountered by his headquarters.

The last element of the Noun part of the A-Noun theory is what an officer uses to further his own development as a staff member. Examples of these are schools, tools, and strategies for stress reduction.

The schools that you attend can include computer courses, typing courses, staff specialty courses, and physical fitness courses. Try to attend as many developmental classes as your schedule will permit. These courses will increase the database you draw upon to complete ideas and incorporate them into your work.

There are many tools that a new staff officer can use to aid in his development. Good examples of these are reference books, computers, files, and any other equipment that aids in completion of the mission.

Strategies that reduce stress are last. Reducing levels of stress is important because stress causes mental and health problems that affect the quality of the work being done. Make use of available time to get out and away from your work. The key to dealing with stress is to take time out for yourself once in a while. Do what you need for relaxation–like exercising or fishing.

The A-Noun theory is based on these four elements –attitude, people, places, and things. I have concluded these elements led to my successes as a staff officer. If you, as a future staff officer, take this theory and develop it to fit your own personality, then you will have the basis to become a staff survivor.

SAY WHAT?

Major R. E. Joslin, USMC
UH-1 Operational Test Director
Marine Helicopter Squadron One
Operation Test and Evaluation Department
Quantico, VA

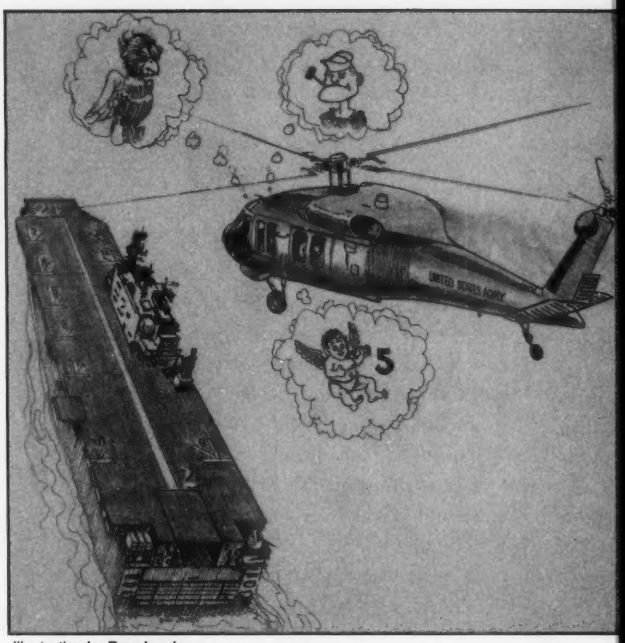


illustration by Don Jacobs

WITH THE INCREASED emphasis on joint service operations, as illustrated by the Grenada and Persian Gulf operations, Army aviators should be familiar with shipboard communication terminology. The primary available reference is the Navy's LHA/LPH (landing helicopter assault/landing platform helicopter) Manual—(Navy Air) NAVAIR 00-80T-106. While it more than suffices in explaining normal shipboard procedures, the manual provides only a superficial exposure to shipboard terminology.

The intent of this article is to provide a primer to nautical terminology to minimize confusion when communicating with ships. For simplicity, we will confine our discussion to operations from large deck ships—LHA/LPH.

When do you need to start talking to the ship? Once you are below 2,500 feet, within 10 nautical miles of the ship, you are in its control zone. You probably should begin talking to the ship's helicopter direction center (HDC). Suppose you spoke to the HDC and the ship responded to your initial radio call with–***"Roger Army copter one two three, BRC is three six zero, cleared starboard D, cherubs five. Say souls, time to splash and intentions. I have a sweet parrot at angels five; report my father. If sour father, report mother with see me. If popeye, pogo for pigeons and buster, over."***

Translation–***"Army copter 123, the ship's heading is 360 magnetic. You are cleared to enter a clockwise racetrack pattern on the right-hand side of the ship at 500 feet. Say how many people are on board, flying time before you flame out, and your intentions. I [the ship] have picked up your transponder code at 5,000 feet; report reception of the ship's TACAN [tactical air navigation]. If you cannot receive my TACAN, then report the ship in sight. If you go IMC [instrument meteorological conditions], switch to the previously assigned frequency for bearing and distance information and proceed at your maximum airspeed."***

You now have established yourself in a starboard delta pattern at 500 feet and are feeling pretty good about yourself, when all of a sudden the HDC says—***"Army copter 123 you are prep charlie, switch/land launch and report crossing the bow."***

Translation–***"Army copter 123 you are clear to cross the bow of the ship. Enter a counterclockwise pattern on the left-hand side of the ship, switch to the tower***

The following is an alphabetical list of some common shipboard terminology to help you decipher radio transmissions:

Air boss – ship's tower controller, normally an O-5

Angels – altitude in thousands of feet

Bow – front of the ship (pointed end)

BRC – base recovery course (the magnetic heading of the ship)

Buster – proceed at maximum airspeed

Center – the ship's approach/departure control

Charlie – cleared to enter a counterclockwise pattern on the left-hand side of the ship and land

Cherub – altitude in hundreds of feet

Delta – a visual flight rule racetrack pattern normally flown clockwise on the right side of the ship, oriented on the ship's heading (i.e. starboard D)

Drink – take on fuel

Father – the ship's TACAN

Feet wet or dry – over water or over land

Foxtrot corpin – old terminology for BRC, if you want to sound salty

Green deck – clear deck

Head – latrine

LSE – landing signal enlisted, the yellow-shirted sailors who direct you to your spot on the ship, they can communicate with the tower but not directly with you

Mother – your parent vessel

Parrot – transponder military identification, friend or foe

Pigeons – magnetic bearing and distance from an aircraft to a specific location

Pogo – return to last assigned frequency

Popeye – IMC conditions

Port – left

Prep charlie – cleared to enter a counterclockwise pattern on the left-hand side of the ship in preparation to land; expect charlie

Primary – the ship's tower frequency (land/launch)

Prifly – normally the ship's tower or the controlling agency in a control zone

Red deck – do not land

Say seat – tell them whether the person in the right, the left, the front, or the back is piloting the aircraft (This is so the LSE can direct you to your landing spot.)

See me/you – ship in sight (Make sure you have identified the right one and save some embarrassment.)

Signal Delta – establish holding pattern as directed

Souls – people on board (crew and passengers)

Sour – not working, normally communication or navigation

Starboard – right

Stern – back of the ship (square end)

Sweet – good reception (communication or navigation gear)

Time to splash – actual time before your complete fuel load will be exhausted and you will flame out (Tell the truth! This information is for accurate sequencing.)

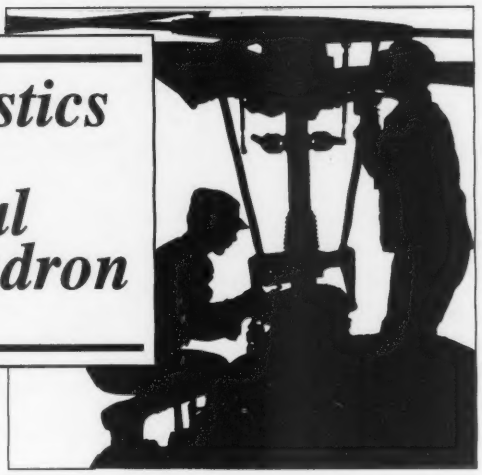
frequency, and report crossing the front of the ship at 300 feet, 80 knots."

You switch up the tower frequency and report crossing the bow. They respond with–***"Army copter 123, green deck, your charlie, spot 3, say seat."***

Translation–***"Army copter 123, the deck is clear and you are clear to land on spot 3. Tell me the seat of the pilot at the controls."***

The only thing left to figure out is which spot is spot 3. However, we will refer that problem to the ship diagrams in the LPH/LHA Manual. The list provided is by no means all encompassing and variations in definitions exist, especially when operating from small deck ships. However, as an Army aviator, you are now at least primed for some of the shipboard jargon you will encounter on your trip out to the ***"U.S.S. Boat."***

Tactical Logistics for the Regimental Aviation Squadron



Major E. F. Veiga

MAJ Veiga was assigned to Headquarters, 4th Squadron, 11th Armored Cavalry Regiment, APO New York, when he wrote this article.

THE REGIMENTAL aviation squadron (RAS) of the armored cavalry regiment needs unique aviation unit support. This requirement results from four primary factors–the density of aircraft, the mix of aircraft, the mission of the RAS, and the unique relationships for logistical support. We must briefly examine these factors to understand and appreciate the logistical organization and execution plans that enable the RAS to accomplish its mission.

The simple fact that the RAS has 74 aircraft will alert any experienced aviator to the basic issue of Class III, V, and IX consumption rates. Factor in 503 authorized personnel and more than 130 vehicles and the challenge for all classes of supply builds quickly.

Three different aircraft types in the quantities that exist in the RAS (figure 1) will quickly age any maintenance officer and heavily tax the table of organization and equipment. These support problems are complicated by the aging OH-58C Kiowa and AH-1F Cobra fleets.

The mission of the RAS, like the aircraft, is threefold. Air cavalry, attack helicopter, and utility or air assault missions can occur simultaneously over the entire frontage of the corps battlefield. Three successive years of maneuver experience on Return of Forces to Germany exercises have shown that frontages of more than 100 kilometers (km) and zones of 50 km or more in depth can tax the squadron's logistical resources to the limit.

These resources are further strained by logistical links. These links include a combination of direct support from the regiment's organic resources and aviation maintenance support from the corps aviation intermediate maintenance (AVIM) battalion. Going to two diverse sources for support, coupled with extraordinary demands on communication, vehicles, and limited support personnel, makes the logistics mission complex.

Meeting the support challenge demands centralization and strict control of key resources. These may be the UH-60 Black Hawk fleet; the support platoon; the single vehicle wrecker; and low-density, high-skill military occupational specialties. The answer for the RAS lies in emulating certain aspects of the time-proven field trains concept. This concept is carefully modified to meet aviation as well as common ground support requirements.

The field trains

The administration and logistics operations center (ALOC), the bulk of the aviation unit maintenance (AVUM) troop, and key element of the headquarters troop (figure 2) comprise the hub of the support concept field trains. The air assault troop is located nearby. It is considered

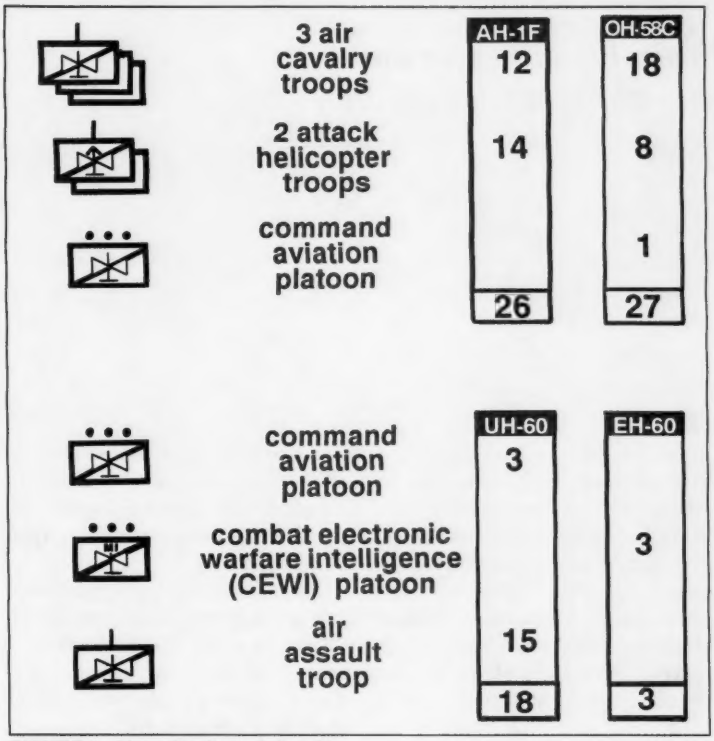


FIGURE 1: Aircraft mix and density

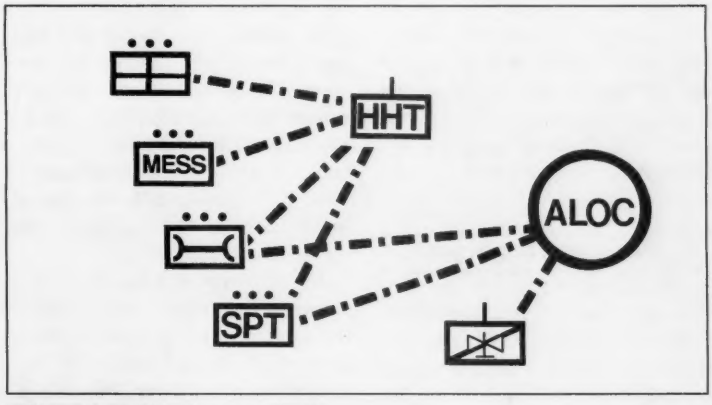


FIGURE 2: Field trains organization

part of the field trains. The air assault troop is essential to squadron deployment and support as well as the emergency resupply of critical classes of supply for the regiment.

Command responsibilities

Field trains command falls to the headquarters troop commander. This is essential because of mission diversity and the coordination and employment decisions that must be made. This enables the S4 to focus on wholesale supply, employment of the support platoon, and equipment status reporting. In many other organizations, the squadron executive officer (SXO) might be the choice for directing logistics. However, because of the depth and speed of regimental operations, the SXO is critical to directing battle staff coordination and war planning in the main command post.

Besides serving as the trains commandant, the headquarters troop commander directs ground support and vehicle recovery effort, medical treatment and evacuation, and Class I operations. He is charged with siting the trains and resolving support issues in coordination with the SXO.

The AVUM commander is charged with three major tasks. First, normal unit maintenance functions must be executed in the field trains. This in no way mitigates the "fix forward" concept that ensures maintenance support wherever it is needed, but speaks instead to the issue of more complex maintenance requirements. This fact alone contributes significantly to the siting of the field trains, which will be discussed later. The AVUM effort includes all scheduled and unscheduled maintenance that cannot be executed forward in zone. Also, the AVUM troop must establish and maintain its link to the

Tactical Logistics for the Regimental Aviation Squadron

direct support AVIM battalion. This is a difficult requirement, which demands an aerial line of communication since distance normally precludes electronic communications.

The second charge for the AVUM commander is repairs forward in the air troop assembly areas short of the main battle area. This usually is accomplished by task organizing repair teams, including technical inspectors and test pilots, as necessary.

Third is the AVUM slice of the dedicated search and rescue (SAR) mission. The air assault troop commander provides a dedicated SAR aircraft on 15-minute standby. The aircraft moves to the vicinity of the ALOC to pick up a medical team and a maintenance contact team capable of (at a minimum) completing battle damage assessment and repair. The presence of the medical team allows the SAR aircraft to provide emergency medical evacuation.

ALOC operations

The S4 is decisively engaged with directing ALOC activities and controlling the support platoon mission. He develops the squadron commander's priorities into missions for the support platoon leader, including the size and general location of forward arming and refueling points. These two officers work together to establish bulk fuel transfer points where the squadron's heavy expanded mobility tactical trucks will be resupplied by the regiment's organic 5,000-gallon tankers or corps assets. The S4 also actively manages all other aspects of wholesale supply except Classes I and VIII, which are managed by the headquarters troop commander. The S4 manages the ALOC work schedules and assigned missions. He also serves as the focal point for all ground and aviation maintenance reporting.

The S1 integrates personnel and medical operations and reporting as well as all other administrative services normally assigned to him. He also controls administrative courier runs (aerial as well as vehicular). He acts as backup to the S4 in managing ALOC operations and provides continuity for all communications with the forward command posts.

Where to put the trains

The site selection for the field trains depends on several key factors. First is the support operation size, which can be more than 200 personnel and 75 to 100 wheeled vehicles. Such a large signature demands maximum dispersion to preclude catastrophic attacks and ensure security.

Second, the nature of maintenance missions requires using white light. To assist with security measures, siting the trains behind the white light line is imperative.

Finally, the field trains must have easy access to the main supply routes (MSRs) in sector. The bulk and volume of resupply the squadron demands require that the trafficability of the MSRs be available.

The presence of the air assault troop does not factor directly into site selection since the troop is not co-located. It is sited nearby (35 km distant). This helps reduce the signature, as long as careful consideration is given to air routes to preclude highlighting the trains' location.

Experience has shown that terrain-oriented sites are not the preferred solution. Such locations usually have poor roadways with inadequate surfaces for conducting aircraft or heavy truck maintenance. Also, the signature of this operation in an otherwise "cold" wooded area invites attack.

In the European scenario, the perimeter of a town, farm, athletic field, or factory site is much more preferable. It helps deal with the challenges of natural camouflage through urban clutter, increased physical protection from attack, and white light use in an acceptable area.

Moving supplies

Squadron displacement over such large areas demands using another time-tested concept–the logistics release point. This process allows all classes of supply (except aviation Class III) to be pushed forward once a day to the air troops and the command posts (figure 3). The S4 noncommissioned officer in charge (NCOIC) assembles the convoy and moves it at the appropriate time, usually dusk, to an easily identifiable location. Normally, this is a built-up area that allows ease of access and maneuverability.

The troops receive their preheated supper meal, the next morning's breakfast, and the next day's lunch. First sergeants and the S3 operations NCOIC are responsible for arranging pickup.

One exception is a hot-gas service for the tactical operations center (TOC). Because the TOC normally is sited in such a way that makes it difficult to refuel vehicles, an easy access refuel point is set up periodically (usually every other day) along the TOC's route to a new site. This will allow refuel on the road within 15 to 20 minutes (figure 4).

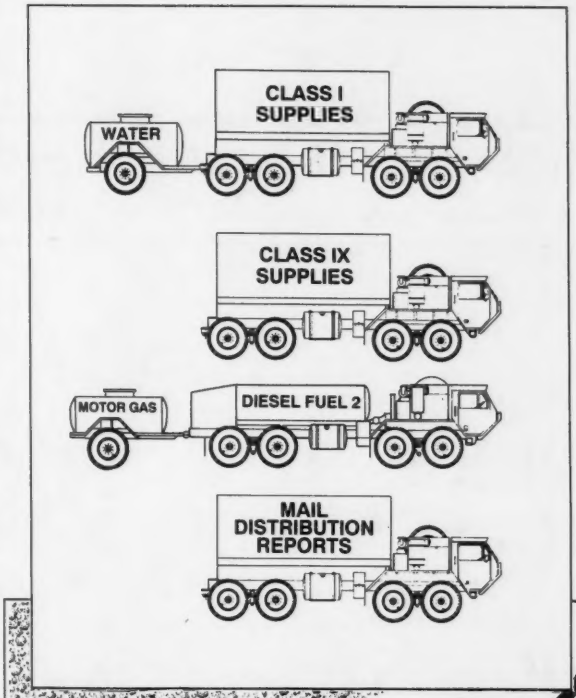


FIGURE 3: Logistics release point

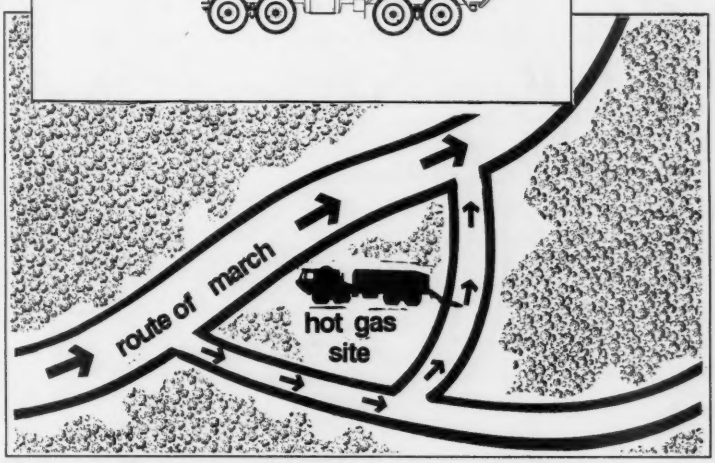


FIGURE 4: Wheeled vehicle hot gas

Making it work

The myriad details and special requirements associated with supporting fast-moving aviation units with high consumption rates make for any number of solutions to the logistics challenge. The solution that has been outlined here takes advantage of several strengths.

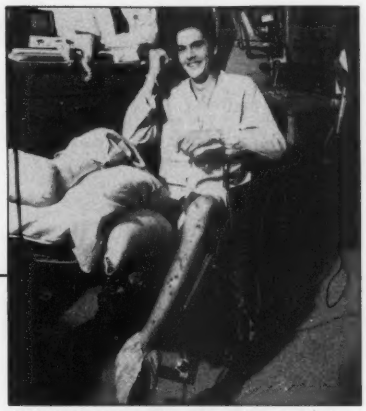
First, J-series designs are based on centralization of certain resources. To accommodate all the unit's needs, these limited resources must be carefully managed.

Second, continual task organizations of these resources are necessary. Centralizing them physically and in terms of command and control ensures an ability to complete this task organization to accommodate rapidly changing missions.

The third strength of this logistical organization is the unity of command. The squadron commander knows who to turn to for integrating and directing support requirements while allowing the air assault troop commander, the AVUM troop commander, and the staff officer associated with the field trains to focus fully on managing their portion of the support package.

HYPERBARICS ENHANCE THE HEALING PROCESS

Sergeant Vicki W. Hudson
Army Flier staff writer
Public Affairs Office
Fort Rucker, AL



PV2 Christopher Roger Bush received hyperbaric treatment for wounds sustained in Operation Desert Storm.

TWO SOLDIERS injured in Operation Desert Storm received specialized medical treatment at Lyster U.S. Army Community Hospital, U.S. Army Aeromedical Center (USAAMC), Fort Rucker, Alabama.

Private E2 (PV2) Christopher Roger Bush lost part of his right foot February 28, 1991, when he stepped on a land mine during Operation Desert Storm. Private First Class (PFC) Raymond Young lost three toes from each foot and received extensive damage to the instep of one foot. The damage was so severe that part of both feet had to be amputated.

PV2 Bush explained, "My unit, 226th Supply and Support Company, was following the 3d Armored Division into Kuwait City to make sure they had fuel so they could keep going forward."

"We had stopped for the day, about 5 miles outside Kuwait City, where 3d Armored Division had apparently engaged in a battle with the enemy the day before. I was out checking my truck and just happened to step on a mine," he continued.

"I was the only one who was injured. The mine didn't damage anyone else, the equipment nor my truck. I don't even know what type of land mine it was, but they told me that it was supposed to kill me," he said.

PFC Young, Company E, 1-18th Infantry Regiment, 197th Infantry Brigade, Fort Benning, Georgia, explained his unit's mission was to cutoff the supply line from Baghdad to Kuwait by blowing up the highway.

"We were on our way back from Iraq, heading to the Saudi border where we and our tanks could be loaded on trucks. It was our turn to start heading home," he said.

PFC Young's military occupational specialty (MOS) is 11H, antiarmor personnel.

"We had been traveling for 12 hours. I was driving an M901 Improved TOW Vehicle when we got to a refuel point. They gave us some food and, basically, we were taking a break for 45 minutes so everyone could relax for a few minutes. I was sitting inside the trac (vehicle), reading a book and eating. We had about 15 minutes before we were going to take off again," explained PFC Young.

He decided to get out and stretch a little."I walked around the right side of the trac—, heading toward the back to talk to one of my buddies. After I got through talking with him, I headed back toward the trac—, the same, exact direction I had just come from. I made it about halfway, and the next thing I knew, there was an explosion, and I was lying on the ground," he said.

"I don't know if I stepped on the land mine the first time or not. I probably just got lucky and missed it within an inch when I first walked to the rear of the vehicle," he said.

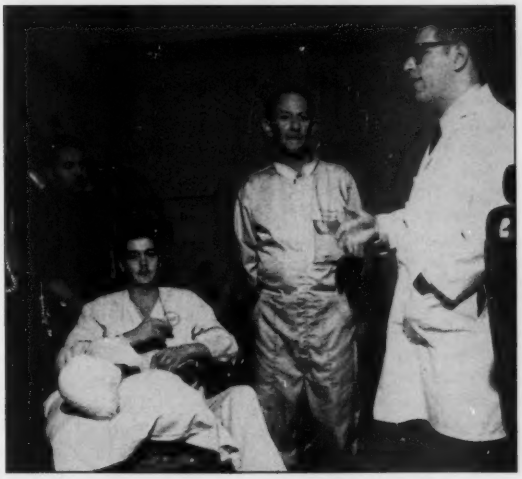
PFC Young was conscious during the entire incident. "The medics were there within a matter of seconds. After they finished prepping me for the medical evacuation (MEDEVAC), they loaded me on a medical evacuation vehicle and drove me out of that area because they didn't want the MEDEVAC helicopter to fly into dangerous territory. So they transported me to a safer area," he said.

Because of injuries sustained from the explosion of the landmines, PFC Young and PV2 Bush were sent back to the United States for treatment.

Both had partial amputations of their feet and other procedures in Eisenhower Army Medical Center, Fort Gordon, Georgia. They were referred to the U.S. Army Hyperbaric Medicine Department, USAAMC, Fort Rucker, because their injuries were not healing properly.

According to Major (MAJ) (Dr.) Jeffrey A. Stone, Chief, Hyperbaric Medicine Department, "Hyperbaric treatment can enhance the healing process in certain types of nonhealing wounds through the introduction of high concentrations of oxygen to the blood and wound."

"In hyperbaric treatment, the wound or damaged tissue is supersaturated with 100-percent oxygen, which increases the oxygen-carrying capacity of



Major (Dr.) Jeffrey A. Stone, Chief of the Hyperbaric Medicine Department at the U.S. Army Aeromedical Center, explains hyperbaric treatment procedures.

the plasma in the blood, along with surgery and antibiotics," said MAJ Stone.

PV2 Bush said the hyperbaric treatment has been great for his injuries. He raised the leg of his pajamas and said, "These are scars that have pretty much healed. They would have taken weeks and weeks to heal. With the hyperbaric treatment they have basically healed in just a matter of days.

"I am just totally impressed with this machinery. I couldn't explain to you what it does, if I had to. But, I can tell you that I feel the healing. I actually know that I'm healing, because I can feel it. I could feel the healing after the first treatment. And I have a lot less pain now. I can't describe it, but it is something I can tell without the doctor telling me," explained PV2 Bush.

PV2 Bush's MOS is 13B, which is artillery. He explained that when he completed his advanced individual training, he was assigned to the 226th Supply and Support Company in Germany. He was

Hyperbaric Medicine

Sergeant Robert Mitchem
Former *Army Flier* staff writer
Public Affairs Office
Fort Rucker, AL

FORT RUCKER, AL, the Home of Army Aviation, is also home to many unusual and often one-of-a-kind gadgets. Few are stranger than the large metal cylinder found in the U.S. Army Aeromedical Center (USAAMC).

According to MAJ (Dr.) Jeffrey A. Stone, Chief, Hyperbaric Medicine Department, there are several hyperbaric chambers located on Department of Defense (DOD) installations around the country. However, Fort Rucker is the only Army installation with a clinical hyperbaric mission.

MAJ Stone and his associate, MAJ (Dr.) Robert W. Weien, are the only hyperbaric medicine (fellowship-trained) physicians in the Army. Both MAJ Stone and MAJ Weien are board-certified in aerospace medicine.

"We are aerospace medicine physicians, but we are subspecialists in hyperbaric medicine," MAJ Stone said.

MAJ Stone was the first physician to treat a patient using the procedure at Fort Rucker in 1986. He describes hyperbaric treatment as a method of enhancing the healing process through the introduction of high concentrations of oxygen to the blood and wound. The plasma is supersaturated with oxygen, which increases the oxygen-carrying capacity of the blood," he said. The chamber creates that environment.

According to MAJ Weien, who is the assistant aviation medicine consultant to The Surgeon General concerning hyperbaric medicine, certain stages of the healing process require oxygen.

"There are some injuries, like burns, that hinder oxygen-dependent healing stages," he said. "Hyperbaric medicine allows the formation of blood vessels in those injuries."

According to Colonel (COL) Robert J. Kreutzmann, Commander, USAAMC, Fort Rucker has a chamber for three reasons.

"Back between 1980 and 1983, when I was the commander here, I learned of a hyperbaric chamber in the Philippines and of its usefulness in treating infections, carbon monoxide poisoning, various infections, those conditions encountered by divers, and pilots at high altitude. So I thought it would be good to have for treatment," said COL Kreutzmann.

"It's also nice to have to complement the training we have going on in our high-altitude chamber. Before, if a student developed a problem, we had to fly them (as close to sea level as possible) to Pensacola, FL, to be treated in one of the Navy's hyperbaric chambers. The high-altitude and hyperbaric chambers now share the same room.

Another reason I wanted one here is for its value as a research tool," said COL Kreutzmann.

Around since the 1600s, the most commonly recognized use for hyperbaric treatment is for those injuries suffered by divers, such as the bends or decompression sickness and the more dangerous—air embolism.

"There are several types of chambers. Fort Rucker's hyperbaric chamber is a multiplace, two-chambered container. It can accommodate three ambulatory (able to walk) and one litter, or six ambulatory patients," said Specialist (SPC) Gregory Welch, chamber operator. The smaller outer chamber acts as a transitional area for any doctor who wishes to enter the main chamber during treatments.

in Germany about 1 week when his unit was deployed to Saudi Arabia.

According to MAJ Stone, "In these two cases, hyperbarics was used acutely to increase the blood flow to the hypoxic tissue. The treatments the soldiers received were very successful, but it was a team effort with hyperbarics, adjuvant to standard medical and surgical care. Both PV2 Bush and PFC Young were able to walk out of the hospital on their own, without crutches or wheelchairs."

PFC Young was optimistic about his future. He said that he might possibly be able to run again. "If they give me the option, I'll probably remain in the Army," he added.

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According to MAJ Stone, the chamber also can be used to treat other conditions such as gas gangrene, burns, and acute crush injuries.

As an example, MAJ Stone referred to a soldier he treated whose foot was crushed when the wheel of a helicopter rolled over it. The nature of the damage restricted the flow of blood to the toes. By placing the patient in the pressurized hyperbaric chamber for specific periods of time, the soldier's toes were saved.

According to the chamber operator, SFC Welch, the procedure also has been used at Fort Rucker to treat a patient suffering radiation necrosis.

"After the doctors performed a biopsy to remove cancer from the side of this guy's neck, they started him on radiation therapy," said SPC Welch. "But after a while, the radiation killed the cell tissue and prevented the wound from healing (radiation necrosis). Four days after we began hyperbaric treatments on him, he started healing. They gave him a total of 30 treatments to ensure he had proper oxygen perfusion in his body," he said.

"A typical treatment consists of taking a patient into the chamber and pressurizing it to a prescribed depth according to the nature of the injury," said SPC Welch.

The patient then goes through intermittent oxygen breathing periods, featuring 100-percent oxygen treatments with ambient air breaks, till the chamber is again at ground pressure. "Treatment can last between 2 to 6 1/2 hours," he said.

Following a training "dive" recently, Sergeant Victor Germain, an inside tender who accompanies patients during their dives, said one of the purposes of the exercise was to familiarize the staff with the feeling of diving to 165 feet below sea level. "That way we can reassure patients by telling them what they are feeling is normal," he said.

MAJ Patricia Chessher, hyperbaric staff nurse, who participated in the dive, described how she felt.

"While going down, you have to keep clearing your ears or it could hurt," she said. Adding that it also gets hot during the dive. MAJ Stone explained that the heat is caused by the increased activity of air molecules as they are compressed.

"But once you get down there, the air-conditioning cools things off, and it gets very nice," said MAJ Chessher, who noted that she also found it funny since everyone's voice gets higher as if they were breathing helium balloons. "It's actually very comfortable," she said.

"A lot of people have commented that they feel super when they emerge from the chamber following a treatment," noted Captain (CPT) Gregory L. Mann, chief physiological officer. "Even after a single treatment, people with old sport injuries, the kind that ache when you get up in the morning, tend to feel better."

However CPT Mann warns, "Hyperbarics is far from being the miracle cure-all some people have been led to believe it is."

"The treatment is beneficial to those whose health has been compromised by certain injuries," said MAJ Stone. "But it isn't effective 100 percent of the time."

According to Colonel Kreutzmann, Commander, U.S. Army Aeromedical Center, Fort Rucker's hyperbaric treatment facility is listed under the DOD Joint Medical Regulating Office so that any patient coming back from overseas with a bad infection can be brought to Fort Rucker. And, according to MAJ Stone, the facility also is on the Diver Alert Medical Network.

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in Germany about 1 week when his unit was deployed to Saudi Arabia.

According to MAJ Stone, "In these two cases, hyperbarics was used acutely to increase the blood flow to the hypoxic tissue. The treatments the soldiers received were very successful, but it was a team effort with hyperbarics, adjuvant to standard medical and surgical care. Both PV2 Bush and PFC Young were able to walk out of the hospital on their own, without crutches or wheelchairs."

PFC Young was optimistic about his future. He said that he might possibly be able to run again. "If they give me the option, I'll probably remain in the Army," he added.

The Aviation Medicine Report is a bimonthly report from the Aviation Medicine Consultant of TSG. Please forward subject matter of current aeromedical importance for editorial consideration to U.S. Army Aeromedical Center, ATTN:HSXY-ADJ, Fort Rucker, AL 36362-5333.

According to MAJ Stone, the chamber also can be used to treat other conditions such as gas gangrene, burns, and acute crush injuries.

As an example, MAJ Stone referred to a soldier he treated whose foot was crushed when the wheel of a helicopter rolled over it. The nature of the damage restricted the flow of blood to the toes. By placing the patient in the pressurized hyperbaric chamber for specific periods of time, the soldier's toes were saved.

According to the chamber operator, SPC Welch, the procedure also has been used at Fort Rucker to treat a patient suffering radiation necrosis.

"After the doctors performed a biopsy to remove cancer from the side of this guy's neck, they started him on radiation therapy," said SPC Welch. "But after a while, the radiation killed the cell tissue and prevented the wound from healing (radiation necrosis). Four days after we began hyperbaric treatments on him, he started healing. They gave him a total of 30 treatments to ensure he had proper oxygen perfusion in his body," he said.

"A typical treatment consists of taking a patient into the chamber and pressurizing it to a prescribed depth according to the nature of the injury," said SPC Welch.

The patient then goes through intermittent oxygen breathing periods, featuring 100-percent oxygen treatments with ambient air breaks, till the chamber is again at ground pressure. "Treatment can last between 2 to 6 1/2 hours," he said.

Following a training "dive" recently, Sergeant Victor Germain, an inside tender who accompanies patients during their dives, said one of the purposes of the exercise was to familiarize the staff with the feeling of diving to 165 feet below sea level. "That way we can reassure patients by telling them what they are feeling is normal," he said.

MAJ Patricia Chessher, hyperbaric staff nurse, who participated in the dive, described how she felt.

"While going down, you have to keep clearing your ears or it could hurt," she said. Adding that it also gets hot during the dive. MAJ Stone explained that the heat is caused by the increased activity of air molecules as they are compressed.

"But once you get down there, the air-conditioning cools things off, and it gets very nice," said MAJ Chessher, who noted that she also found it funny since everyone's voice gets higher as if they were breathing helium balloons. "It's actually very comfortable," she said.

"A lot of people have commented that they feel super when they emerge from the chamber following a treatment," noted Captain (CPT) Gregory L. Mann, chief physiological officer. "Even after a single treatment, people with old sport injuries, the kind that ache when you get up in the morning, tend to feel better."

However CPT Mann warns , "Hyperbarics is far from being the miracle cure-all some people have been led to believe it is."

"The treatment is beneficial to those whose health has been compromised by certain injuries," said MAJ Stone. "But it isn't effective 100 percent of the time."

According to Colonel Kreutzmann, Commander, U.S. Army Aeromedical Center, Fort Rucker's hyperbaric treatment facility is listed under the DOD Joint Medical Regulating Office so that any patient coming back from overseas with a bad infection can be brought to Fort Rucker. And, according to MAJ Stone, the facility also is on the Diver Alert Medical Network.

PEARL'S

Personal Equipment And Rescue/survival Lowdown

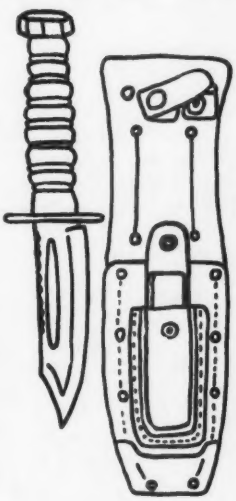
Survival Knives

Every aircrewmember has one or more survival knives, but what do you know about them? Well, they are supposed to cut things when needed. How many times have you complained that the knife you were issued won't cut hot butter, or perhaps you use more descriptive and colorful words as to why this or that knife can't cut it. Sometimes we forget that the knives we have are more than just cutting devices. They are actually multipurpose tools and are intended to do more than just cut. For this reason, they are made of materials that provide the best compromise to withstand the rigors of all the jobs they are designed to do.

As you know, fine cutlery, which holds a sharp cutting edge, is costly and will break if a good side-load is applied to the blades because they are made from a high-grade, hardened steel. Survival and general purpose knives will not break as readily when side-loaded. They are made of a more flexible steel that does not hold a sharp edge as well. (We can survive with a knife that cuts reasonably well, or even poorly, but we can't survive with a broken blade.) For this reason, Army survival kits include a knife sharpener, and the larger hunting/survival knife comes with a sharpening stone.

There are three types of survival knives issued to Army aircrews. Everyone is issued at lease one, most have two, and some have all three.

< Pocket Knife with Hook Blade (National Stock Number [NSN] 5110-00-526-8740). This knife has a 3 1/6-inch standard cutting blade that has a spring-loaded opening device (switch blade), a hook blade (for cutting parachute suspension lines), and is orange in color. (Don't carry this knife in your pocket to show all your friends.) This knife is issued with the OV-1 survival vest only.



Hunting Knife with Sheath and Sharpening Stone > (NSN 7340-00-098-4327). This knife has a 5-inch cutting blade with serrations (saw-tooth) on the back of the blade for cutting wood and some metals, such as aircraft skin. This knife is issued with the OV-1 and SRU-21/P survival vests.

Pocket Knife, General Purpose > (NSN 5110-00-162-2205). This knife has one standard blade, a screwdriver with bottle opener, a can opener blade, and a leather pouch. It is issued with the SRU-21/P vest, all survival kits, and it is found in most mechanics' tool boxes.

PEARL'S Survival Radio Information

AN/PRC-90-2 Survival Radio and TS-24B Tester Maintenance Concept. Army Aviation Organic Support for the PRC-90-2 and TS-24B began on 1 October 1990. These items will no longer be sent to the manufacturer (ACR, Inc.) for maintenance or calibration. The maintenance concept (i.e., aviation intermediate maintenance [AVIM]) as outlined in Technical Manuals (TMs) 11-5820-1049-12, 30, and 23P will govern the operations and maintenance of the AN/PRC-90-2.

The Test Set. TS-24B will be repaired and calibrated by the U.S. Army Test, Measurement, and Diagnostic Equipment Support Group (USATSG) as outlined in TMs 11-6625-3203-13 and 23P and Technical Bulletin 9-6625-2237-35. Calibration interval for the TS-24B is 210 days. All necessary repair parts are available. The test adapter (NSN 6625-01-319-2829) and cable assembly (NSN 5995-01-318-0677), which are required for AVIM maintenance, are fabricated by Sacramento Army Depot (SAAD), Sacramento, CA, and shipped to all AVIMs. If your AVIM does not have these items, some spares are available. If you need assistance, contact the U.S. Army Communications and Electronics Command (CECOM), Fort Monmouth, NJ. The CECOM points of contact are maintenance, Mr. Sal Fox, DSN 992-5016 and logistics, Mr. Frank Minakowski, DSN 992-5327.

Remember, the maintenance/calibration concept is only for the AN/PRC-90-2 and TS-24B. Older AN/PRC-90 survival radios cannot be repaired at AVIM level. For those of you who have, or will soon receive, the AN/PRC-112 Survival Radio and associate equipment, your CECOM maintenance point of contact is Mr. Leon Pearlman, DSN 992-4838.

If you have questions about ALSE or rescue/survival gear, write to AMC Product Management Office, ATTN: AMCPM-ALSE, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798; or call DSN 693-3573 or Commercial 314-263-3573.

U.S. Army Class A Aviation Flight Mishaps

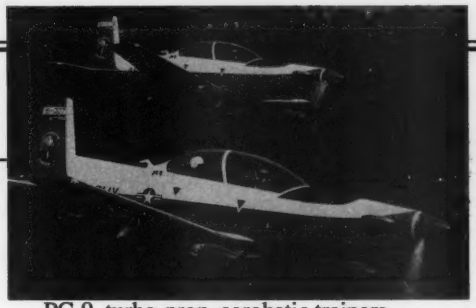
	Number	Flying Hours	Rate	Army Fatalities	Total Cost (in millions)
FY 90 (through 31 July)	25	1,383,237	1.81	31	$ 122.0
FY 91 (through 31 July)	43	1,345,116*	3.20	35	$ 160.2

*estimated

TEST AND EXPERIMENTATION COMMAND

Photo-Chase Aircraft

Wayne E. Hair
TEXCOM Public Affairs
Fort Hood, TX



PC-9 turbo-prop aerobatic trainers

THE ARMY AND AIR FORCE have agreed to pursue the goal of air drops in combat 300-feet above ground level at velocities up to 250 knots.

Future testing toward this goal will include low-altitude, retro-rocket systems for heavy equipment and new tactical assault personnel parachutes. There are also new Air Force transport aircraft on the horizon, such as the C-17 Airlifter.

Among the primary missions of the U.S. Army Test and Experimentation Command (TEXCOM) Airborne and Special Operations Test Directorate, Fort Bragg, NC, are the operational testing and certification of parachutes and air delivery systems. The photo-chase aircraft plays a key role in support of this mission. Several different types of aircraft have been used for the air-to-air task of providing a visual record of air drop test events since the early 1970s. These aircraft include Beechcraft T-34 Mentors and most recently—North American T-28 Trojans.

However, the 40-year-old T-28s can no longer meet the challenges of emerging technology and doctrinal requirements. In June 1991 three new aircraft arrived at Fort Bragg to replace old warhorses.

Freshly painted in orange and white, three new PC-9 turbo-prop aerobatic trainers landed at the test directorate's Yellow Ramp at Pope Air Force Base, NC, adjacent to Fort Bragg. Flown from the factory (Pilatus Aircraft Limited) in Stans, Switzerland, the PC-9s will take over the photo-chase mission from the T-28s. The last T-28 in U.S. military service was retired to the U.S. Army Aviation Museum, Fort Rucker, AL, in July 1991.

Doctrinal goals for air drops at lower altitudes and faster airspeed, along with emerging technologies, are expected to challenge the photo-chase mission. These new aircraft are expected to meet the long-range requirements.

The PC-9s are assigned to the Aerial Photography Branch of TEXCOM Airborne and Special Operations Directorate. The branch is staffed with professional civilian pilots, mechanics, and photographers.

Critical to the success of a photo-chase mission is the ability of the pilot, with positioning instructions from the back-seat photographer, to fly precise formation with the drop aircraft (C-5A Galaxy, C-141 Starlifter, C-130 Hercules, and other Air Force transport aircraft or Army helicopters). A wide range of photographic equipment, from 16 millimeter, high-speed motion picture to shuttered video systems, is used to record test events. Test events must be recorded beginning with the exit of the load

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TOP: The historic T-28 aircraft on the left face their modern replacements, the PC-9, in front of the TEXCOM Airborne and Special Operations Test Directorate hangar at Fort Bragg, NC.

LEFT: As the Airborne and Special Operations Test Directorate paratroopers exit a C-130 Hercules, a PC-9 moves within a safe distance to photographically document the jump procedures.

or jumper from the drop aircraft to ground impact and parachute cut-away.

A time signal, recorded from a satellite receiver onboard the PC-9s, provides synchronization with the ground station data collection systems and those mounted inside the drop aircraft.

Photo-chase missions are normally accomplished with two PC-9s. The first PC-9 is positioned close to the side of the drop aircraft. The pilot concentrates on the extraction or exit and then executes a tight, descending spiral turn around the test air drop load after it clears the drop aircraft.

The second PC-9 may employ a turn-down maneuver in the opposite direction of the first PC-9, or it may be used to concentrate on a specific data collection requirement.

Because the pilots execute near acrobatic maneuvers, the photographer can maintain focus on the target load during the extraction and parachute deployment sequences.

While recording test events, the PC-9 crews provide additional eyes for the drop aircraft. They alert the drop aircraft of any stability or controllability hazards. The photo-chase aircraft has become an essential addition to the operational safety of every mission.

The Aerial Photography Branch continues to improve its capabilities and keeps pace with technological changes and doctrinal developments for the airborne concepts of the future. They also have maintained an enviable aviation safety record.

Since first employing the photo-chase mission in 1972, no Class A or B accidents have been recorded, according to the U.S. Army Safety Center, Fort Rucker, AL.

Use of chase aircraft has significantly reduced the risk for repetitive airdrops by providing closeup, high-resolution video analysis. The analysis allows for corrections in procedures or equipment prior to subsequent iterations of the testing process.

ATC FOCUS
U.S. Army Air Traffic Control Activity

Automated Weather Observation System (AWOS)

George H. Collie
Acting Chief, Air Traffic Control Requirements Division
U.S. Army Air Traffic Control Activity
Fort Rucker, AL

There is a new concept out regarding aviation weather called Automated Weather Observation System or Automated Surface Observation System (AWOS/ASOS). The AWOS is the Federal Aviation Administration (FAA) system and ASOS is the National Weather Service (NWS) system. For the purposes of this article, we will call the system AWOS.

Over the next 5 years, the NWS and the FAA plan to install an automated system at most civil airports and some military airfields, particularly airfields with joint military and civil operations. This program also includes Alaska and Hawaii. It will not be necessary for an airport to have air traffic control (ATC) or manned federal weather observing facilities.

The FAA's Advisory Circular (AC), AC 150-5220-16A, contains the FAA standard for nonfederal AWOS systems. The circular states that an AWOS that has been manufactured, installed, and maintained according to the criteria in AC 150/5220-16A is approvable as a source of weather information that partially satisfies FAA Regulations. The AWOS may be eligible to receive a broadcast frequency assignment or to broadcast over a navigational aid (NAVAID). The AWOS reported weather may be eligible to be distributed over the national weather networks. It also could become eligible for funding under federal grant programs. The systems will be installed in accordance with criteria for weather sensing devices.

Weather information is gathered by the sensing devices and may be transmitted by wire or radio to a variety of displays—

❍ The AWOS reports may be displayed on a special monitor inside the airport tower or terminal in large, 3/8-inch high letters and updated every minute.

❍ Pilots can receive AWOS over an assigned frequency, be it NAVAID or radio. The information is also synthesized into voice and transmitted each minute. This information makes it possible for the pilot to know the reported weather at the landing area at that moment.

❍ The AWOS can be accessed by telephone and receive a synthesized voice report of the current weather conditions.

❍ Pilots also will be able to display the data on their personal computers via telephone and modem hookup.

❍ The weather report can be received by anyone on the ground within radio reception distance of the airport. These individuals must have a radio receiver that will tune to the frequency of the NAVAID or frequency by which the AWOS is transmitting (in most cases a very high frequency). The radio receiver method of getting the reported weather should be especially useful for briefing and flight planning rooms. It also can be useful for anyone interested in knowing the current reported weather.

A radio receiver that receives synthesized voice transmission of the AWOS report usually costs less than $100.00.

The AWOS can be provided in five configurations. The first configuration is the AWOS A system. This system contains only dual pressure sensors that measure barometric pressure and reports the altimeter setting. The other four configurations add more capability until AWOS IV, which gives a complete aviation weather sequence to include precipitation occurrence, type and accumulation, freezing rain, thunderstorm, and runway surface condition.

The coming of AWOS opens up many possibilities, for instance. A location that has no local source for altimeter could have much lower instrument approach minimums if it had an AWOS with altimeter capability. Locations that do not meet the requirement for weather reporting capability to establish a control zone could meet that requirement with AWOS. There are a variety of situations out there.

The U.S. Army ATC Activity (USAATCA) is aware of this new capability and is studying it for application to our ATC needs. The U.S. Army Aeronautical Services Agency, Cameron Station, Alexandria, VA, the proponent for weather applications in the Army, is aware of the program. The agency recently advised USAATCA that they expect to publish some Army guidance regarding the systems and their applications.

Further information concerning AWOS standards and the FAA approval process may be obtained from the AWOS Program Office, FAA, ATTN: Program Director for Weather and Flight Service Systems, Engineering Division, ANW-100, Washington, DC 20591, telephone (202) 267-8676.

Readers are encouraged to address matters concerning air traffic control to:
Commander, USAAVNC, ATTN: ATZQ-ATC-MO, Fort Rucker, AL 36362-5265.

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